A HISTORY OF HYDRO-ELECTRIC POWER IN MANITOBA

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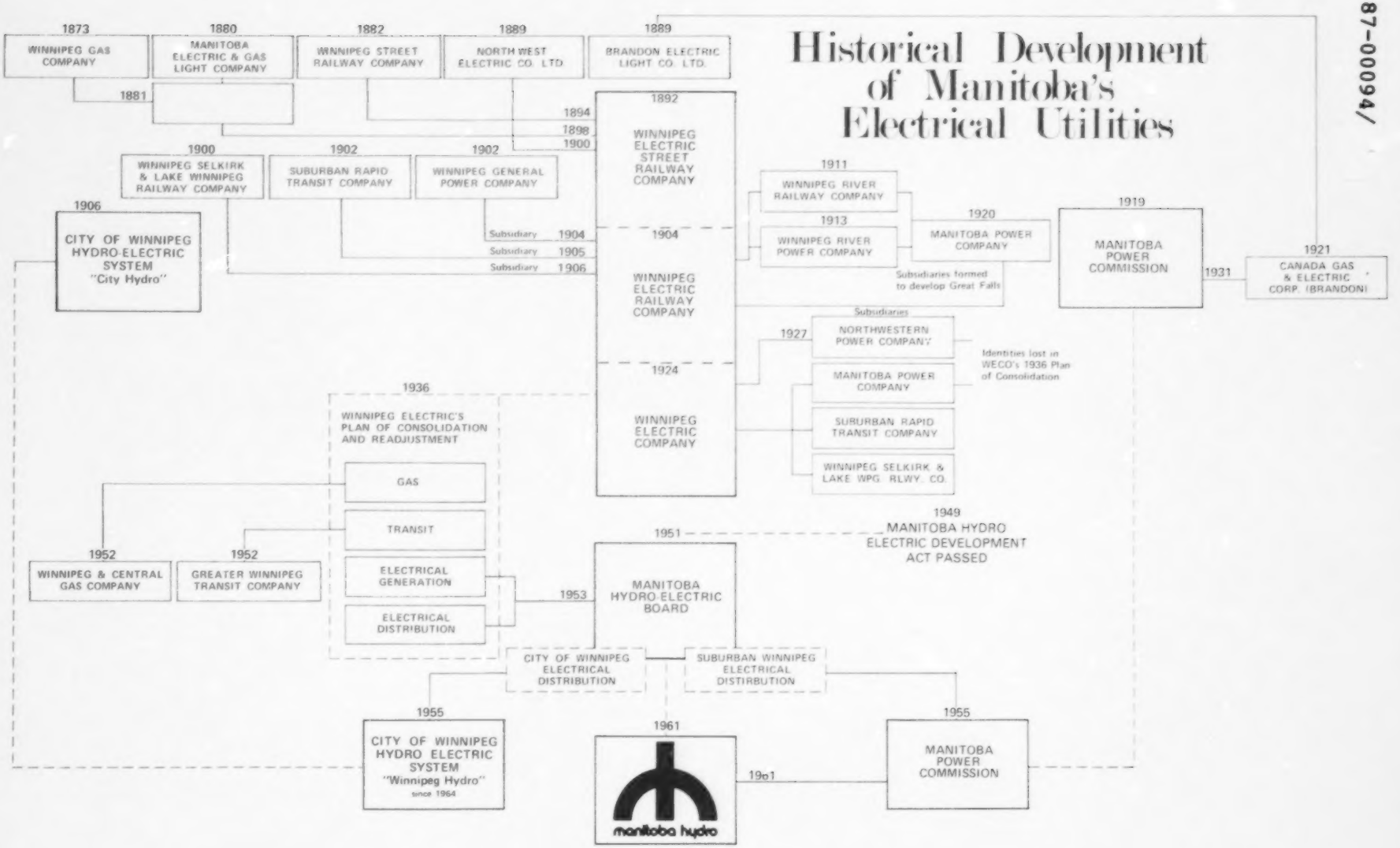
Historical Development of Manitoba's Electrical Utilities



A HISTORY OF HYDRO-ELECTRIC POWER IN MANITOBA

The history of the electric power industry in Manitoba tells the story of expediency, foresight and public responsibility. It began over a century ago during the pioneer days of street lighting and street railway transportation in Winnipeg. Before long, as the novelty of the new energy source gave way to necessity, other large communities in the province wanted the benefits that electrical service would bring. They received electrical service, often at very high costs.

A few farsighted individuals saw the enormous advantages of large scale generating facilities. Among them were a number of public spirited citizens who felt that electricity should be made available at the lowest possible cost to the consumer.

There followed over the years a successive series of amalgamations, purchases and government appointed bodies until finally, by the 1940s the myriad companies and municipal utilities evolved essentially into three major electrical utilities:

Winnipeg Electric Company: a privately-owned utility serving the City of Winnipeg and its suburbs. Originating in 1882 as the Winnipeg Electric Street Railway Company, by 1906 the utility had a monopoly on the transit service, electric light, power, and gas distribution in the Winnipeg area.

City of Winnipeg Hydro Electric System (City Hydro): a publicly-owned utility formed in 1906 to check the power monopoly held by Winnipeg Electric Street Railway Company.

Manitoba Power Commission: a government agency formed in 1919 for the purpose of extending the benefits of large scale generation to rural Manitoba. Power was purchased initially from City Hydro and later from the Winnipeg Electric Company.

By the end of World War II it had become evident that the future power requirements of Manitoba would be best served by a single utility for developing and supplying electrical energy. The end result of that decision was the formation of The Manitoba Hydro-Electric Board in 1949 by the Manitoba Government.

During the next decade the distribution and generating facilities in Manitoba were consolidated first in 1952 when the government authorized The Manitoba Hydro-Electric Board to acquire the Winnipeg Electric Company. Then, in 1955, an agreement was reached between The Manitoba Hydro-Electric Board, Manitoba Power Commission and City of Winnipeg Hydro, whereby:

1) all distribution properties in the suburbs owned by City Hydro were sold to the Manitoba Power Commission.
2) all distribution properties in the City of Winnipeg owned by the former Winnipeg Electric Company were sold to City (Winnipeg) Hydro which today is still the sole distributor of electrical energy within the inner area of the city.

By 1961 the Manitoba Government decided to unite the two provincial utilities. The Manitoba Hydro Act was subsequently passed by Legislature on April 1, 1961, providing for the amalgamation of the Manitoba Power Commission and The Manitoba Hydro-Electric Board into a single crown agency to supply the future electrical needs of our province.

It was in 1973 when the last of the small independent electrical systems joined Manitoba Hydro, coincidentally marking 100 years since the first power utility was incorporated in the province. Since then, Manitoba Hydro has continued to strengthen its reliability, expand its interconnections and make technological inroads in the electrical industry.

The following chronology briefly describes some of the significant events in Manitoba Hydro's history.

EARLY BEGINNINGS

1873 WINNIPEG GAS COMPANY was incorporated March 8 to provide the City of Winnipeg with gas lighting. The company, which materialized as no more than a holding company, amalgamated with Manitoba Electric and Gas Light Company in 1881. (One of the founders of Winnipeg Gas was Donald A. Smith who later became Lord Strathcona.)

1880 MANITOBA ELECTRIC & GAS LIGHT CO. was incorporated February 14 by an Act of Manitoba Legislature. The company was granted wide powers to "supply light and heat in Manitoba by gas, electricity or other means". The company was purchased by the Winnipeg Electric Street Railway Company in 1898.

1881 WINNIPEG GAS CO. and MANITOBA ELECTRIC & GAS LIGHT CO. merged.

1882 WINNIPEG STREET RAILWAY CO. was incorporated May 27 under the management of Albert W. Austin who obtained a charter from the City to operate horse-drawn streetcars on Main Street. The City granted Austin's company the rights to construct and operate street railways in the City of Winnipeg as well as in the parishes of St. Boniface, St. John's, St. James and Kildonan. The first horse-drawn car went into operation October 21, 1882.

On the two evenings of June 14 and 15, a demonstration of the electric light in arc form was given for about two hours each evening at the C.P.R. crossing on Main Street. This was being accomplished by three lamps outside and one inside the engine house of the Patterson & McComb Lumber Company, whose steam engine was being used to drive the small dynamo that a Mr. P.V. Carroll of New York had brought to Winnipeg for the purpose of "exhibiting the electric light with which he hopes to obtain a contract for illuminating the streets of the city".

By October 16, four lamps had been located along Main Street from Broadway to the C.P.R. crossing, and on that evening were turned on for the first time. Another nine were strung around the engine house of the Hudson's Bay Company grist mill, which were in process of adjustment prior to going out on the street. The mill engine had been engaged to drive the small dynamo each evening for the time being, and this electrical enterprise was known as the Manitoba Electric Light & Power Company. Despite an application for a charter in June, this was never granted, and the organization was otherwise referred to as the Electric Light Company.

1883 THE NORTH WEST ELECTRIC LIGHT AND POWER COMPANY (LTD.) was incorporated August 25 under the Manitoba Joint Stock Companies Act to provide electric supply and lighting to any city or town in Manitoba. Principal shareholders were Charles J. Bridges, the Hon. Corydon P. Brown, Horace McDougall, James Ferguson Munsie, and Frank Graham Walsh. The activities that led to the formation of this company follows.

In February, Mr. Carroll gave notice to the Council that he would no longer be responsible, and that James Austin would be the assignee. James F. Munsie, who had been in the background since November, proposed that he would supply electric street lighting in a more satisfactory manner if he were to be given a contract. This was granted, and a company registered as the North West Electric Light & Power Company (Ltd.) came into being. On June 23 it was reported "for the first time the power of the N.W.E.L.&P.Co. was used last evening to light the street(s)."

The plant was located "on Wesley Street - near Water Avenue" by directory identification, and remained there until around 1889. Street lighting had by then been removed by the Manitoba Electric & Gas Light Company, leaving only a few commercial services now of uncertain amount and extent for the N.W.E.L.&P. to service.

1889 NORTH-WEST ELECTRIC CO. LTD. was incorporated under the Manitoba Joint Stock Companies Act to "build and operate electric lighting systems, electric street railways, etc. in various cities, towns and villages in Manitoba". North-West was purchased by Winnipeg Electric Street Railway Company in 1900.

Other than street lighting, it was not until September 6 that "the Manitoba Electric & Gas Light Company's incandescent system of lighting was turned on for the first time last evening", this being in Seed's fruit store on Portage Avenue east of Main Street. Soon to be followed by

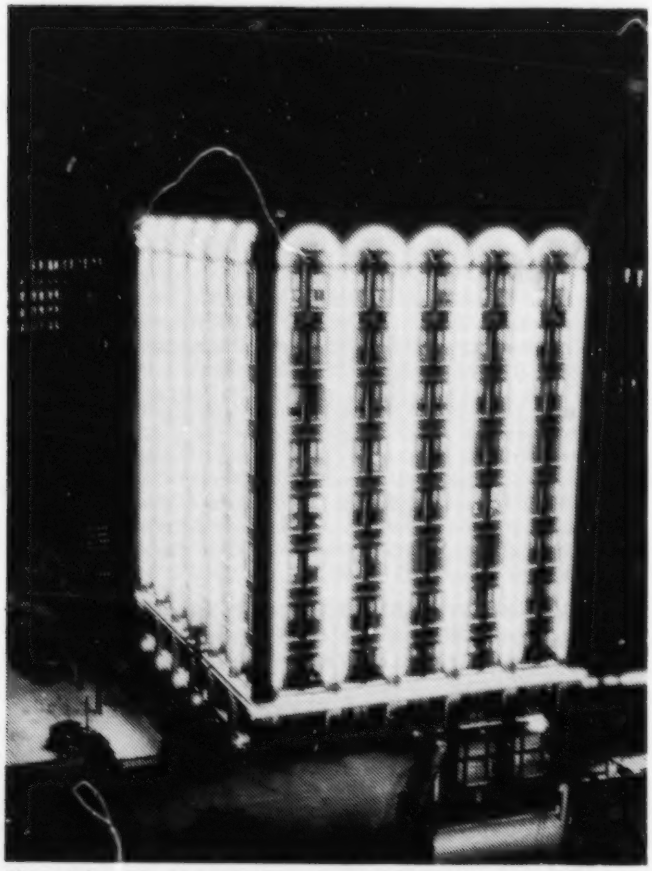
Farmers travelling four miles south of Jordan alongside one of the first transmission lines originating from the Portage la Prairie substation. (1928)

that of the new North-West Company, there is no recorded reference for this other "first" having been found. Of the four identities given, only the building remains today of the North-West Electric Company, now in use as 33 Water Avenue.

1889 BRANDON ELECTRIC LIGHT CO. LTD. (year formed unknown) constructed a steam plant in the City of Brandon to supply the city residents with electricity for heat and light. The company was taken over by Canada Gas in 1921.

1891 FIRST ELECTRIC STREETCAR — The first Edison car to be manufactured in Canada made its maiden run on January 28 along River Avenue in south Winnipeg. A demonstration run, it was Mr. Austin's attempt to convince City Council to grant Winnipeg Street Railway Company the franchise for operating electric street cars in Winnipeg.

During the next three years Austin had at least four cars operating from the south end of Main Street bridge, along River Avenue and down Osborne Street to Elm Park. The cars were powered from a small steam plant (30 h.p. generator) that Austin built on Assiniboine Avenue near Main Street.



The mighty, electric-transit-gas empire of W.E.R.Co. built the 11-storey Electric Railway Chambers in 1912 at the corner of Notre Dame and Albert in Winnipeg.

Honourable G.H. Grierson, Minister of Public Works was appointed first Minister in charge of the Manitoba Power Commission in 1919.

1892 WINNIPEG ELECTRIC STREET RAILWAY COMPANY was incorporated by an Act of Legislature of Manitoba on April 20 to "construct and operate an electric street railway on the streets of the City of Winnipeg, St. Boniface and adjacent municipalities; to sell electric heat, light or power". A by-law that had been passed December 31, 1891 provided WESRCo. with an exclusive franchise to operate the street railway for a period of 35 years. On July 26, 1892 the company operated its first electric car on Main Street. Regular service began on September 5. Power for the company was supplied by Manitoba Electric & Gas Light Company.

1894 WINNIPEG ELECTRIC STREET RAILWAY COMPANY purchased Albert W. Austin's assets and properties for $175 000. Austin, having lost out on the electric streetcar franchise continued to operate horse-drawn cars along Main Street for another two years before finally selling out to his competitor. The last horse-drawn car made its final run on May 11, 1894.

1895 ASSINIBOINE STEAM PLANT — Winnipeg Electric Street Railway Company built a new steam plant at or near the site of Austin's plant on Assiniboine Avenue. The plant was officially opened on November 12 with initial generating capacity of 750 h.p. Built at a cost of $65 000 the plant consisted of four boilers each rated at 250 h.p. The plant was dismantled in 1916.

1898 WINNIPEG ELECTRIC STREET RAILWAY CO. acquired all franchises, rights and properties of the MANITOBA ELECTRIC & GAS LIGHT COMPANY for $400 000.

AN ERA OF GROWTH

1900 MINNEDOSA RIVER PLANT — The first hydro plant in Manitoba went into operation on the Minnedosa River approximately 1-1/2 miles north of its junction with the Assiniboine River. Operated by the Brandon Electric Light Company Ltd., the plant served the City of Brandon located some nine miles to the east via an 11 000-volt wood pole line. The plant operated eight months of the year. The average operating head was 26 feet.

Construction of the Minnedosa River plant was financed by Judge Walker of Winnipeg, and Messrs. George Patterson and E.L. Christie of Brandon. The plant was dismantled in 1924 following the purchase of the company three years earlier by the Canada Gas & Electric Company of Brandon.

1900 WINNIPEG SELKIRK & LAKE WINNIPEG RAILWAY COMPANY was formed by special Act of Legislature to provide rail transportation north from Winnipeg to West Selkirk and the western shore of Lake Winnipeg. The municipalities of Kildonan, St. Paul, St. Andrew and Gimli were included. Originally a steam railroad, the line was electrified when it was acquired by the Winnipeg Electric Company as a subsidiary in 1906. Service continued to Selkirk until September 1, 1937 at which time the electric cars were replaced by gas bus service.

1900 WINNIPEG ELECTRIC STREET RWY. COMPANY purchased the NORTH-WEST ELECTRIC COMPANY on June 9.

1902 SUBURBAN RAPID TRANSIT COMPANY was incorporated by special Act of Legislature of Manitoba to run cars from the western boundary of the City of Winnipeg, on both sides of the Assiniboine River, to Headingly. Service on the north side of the river extended to Headingly in 1903, but on the south side the line only got to Charleswood.

Taken over by the Winnipeg Electric Railway Company as a subsidiary in 1905, the company was further empowered by special Act of Legislature to build and operate lines through the rural municipalities of St. Francois Xavier and Portage la Prairie. Starting in 1931 the transit rail line was progressively cut back until 1955 when the last car, to Deer Lodge, was replaced by bus service.

The Cook by Wire float as it appeared in the Carman May 24, 1926 parade. The electric stove on the float was the only one available for sale in the town.

Mr. J.M. Leamy, first Hydro Commissioner, appointed July 1919.

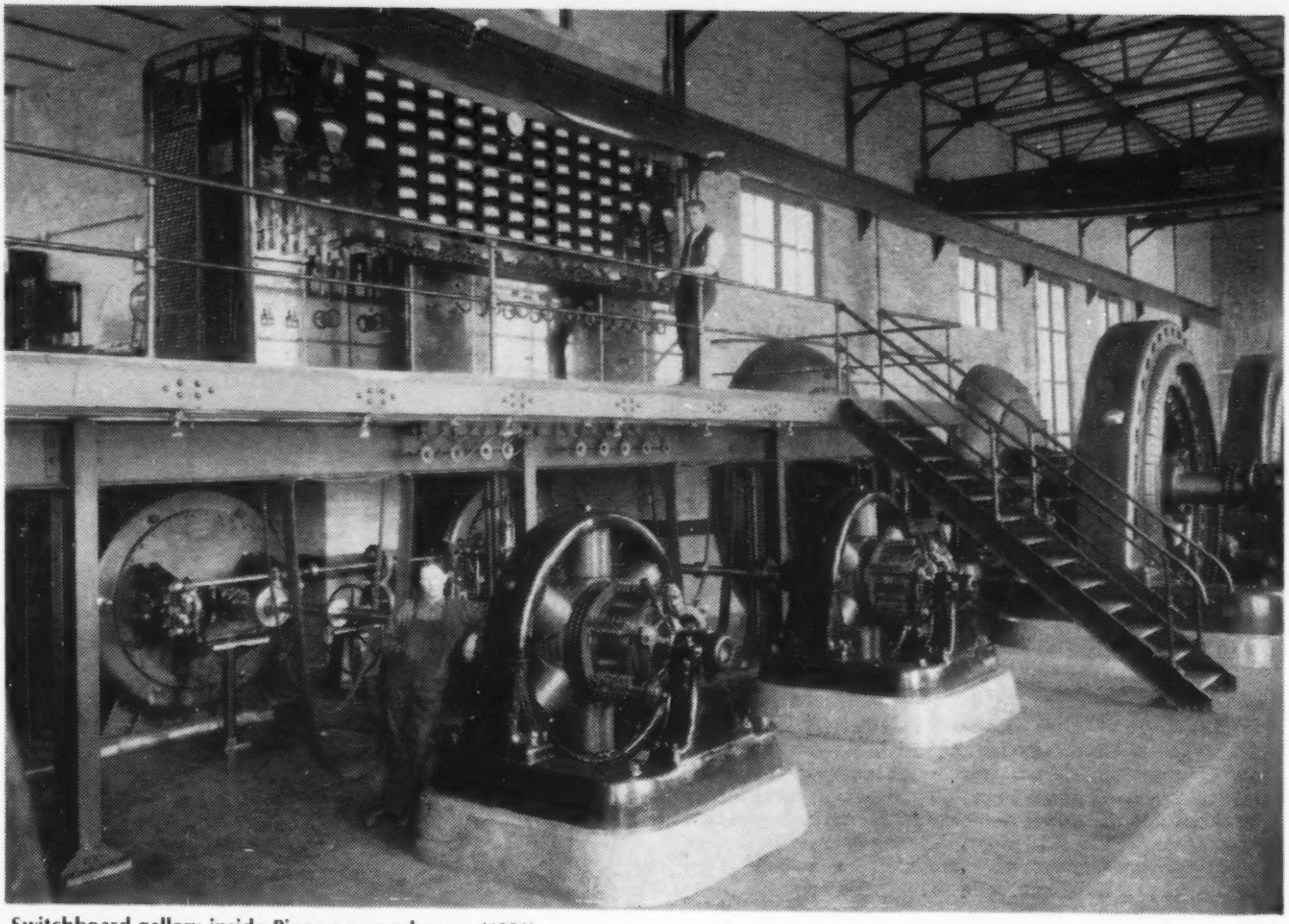
1902 WINNIPEG GENERAL POWER COMPANY was incorporated March 1 by special Act of Legislature of Manitoba. The company was given the fullest powers to develop, transmit and distribute electricity in the province and to develop a hydro-electric power plant at Pinawa.

1904 WINNIPEG GENERAL POWER COMPANY officially amalgamated with the WINNIPEG ELECTRIC STREET RAILWAY COMPANY on July 26. The new company became known as WINNIPEG ELECTRIC RAILWAY COMPANY.

1905 WINNIPEG ELECTRIC RAILWAY COMPANY purchased SUBURBAN RAPID TRANSIT on October 26. As a subsidiary of WERCo., the suburban line continued to operate under its original company name.

1906 CITY OF WINNIPEG HYDRO ELECTRIC SYSTEM was formed as a publicly-owned utility to check the power monopoly held by the privately owned Winnipeg Electric Railway Company. Alderman John Wesley Cockburn, who held development rights to the Pointe du Bois site on the Winnipeg River in his own name, surrendered these rights to the City for construction of a power plant there. The plant was completed in 1911.

1906 WINNIPEG ELECTRIC RAILWAY CO., on taking over the WINNIPEG SELKIRK & LAKE WINNIPEG RAILWAY CO. as a subsidiary, gained the monopoly on all transit service, electric light, power and gas distribution in and around the City of Winnipeg.



Switchboard gallery inside Pinawa powerhouse. (1906)

1906 PINAWA POWER PLANT was the first hydro-electric power plant on the Winnipeg River and the first hydro-electric plant in Manitoba to operate the year round. Located on the Pinawa Channel of the river, the plant was built by Winnipeg Electric Railway Company for an initial investment of $3 000 000. It operated at a head of 46 feet. Officially opened May 31 by Lieut. Governor Sir Daniel McMillan, the plant delivered first power June 9, and steady service began around June 11.

During the first year of the plant's operation six units went into production at a rated capacity of 8000 kilowatts. In 1907 units 7, 8 and 9 were added, bringing the total station capacity to 14 000 kW, and in 1912 the plant was rerated to a total of 22 000 kW.

Pinawa retired September 21, 1961 to provide more efficient use of water flows at the Seven Sisters power plant which was completed in 1952.

1911 POINTE DU BOIS HYDRO-ELECTRIC GENERATING STATION was completed by the City of Winnipeg Hydro Electric System. The first hydro plant to be constructed by the publicly-owned utility, it is the oldest plant still operating on the Winnipeg River today. Initial development cost was $3 250 000.

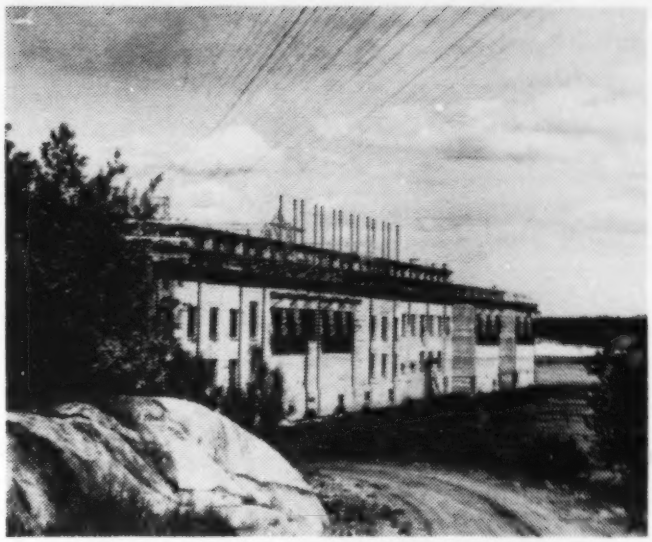
First power from Pointe du Bois was delivered to Winnipeg on October 16, 1911 and during the fiscal year 1911-12 units 1 to 4 and unit 7 went on line. More units were added in 1914, 1917, 1921, 1924 and 1926 for a total of 16 units and generating capacity of 70 000 kW. The plant was later rerated at 72 000 kW. Operating head is 46 feet.

1911 WINNIPEG RIVER RAILWAY COMPANY was incorporated on March 24 by special Act of Legislature of Manitoba. The company was empowered to operate "by steam or other power from a point at or near Lac du Bonnet, to a point at or near Lake Winnipeg at the mouth of the Winnipeg River" (Great Falls became the chosen site). The company, which was financed by WERCo., became an affiliate of the Winnipeg River Power Company (see 1913). However, due to later financing difficulties, the assets of both companies were taken over by the Manitoba Power Co. (see 1920).

1912 MILL STREET STEAM PLANT in Winnipeg was built by Winnipeg Electric Railway Company as an auxiliary plant and terminal point for power generated at Pinawa. All four units went into operation during the first year for a total station capacity of 12 000 h.p. Mill Street was closed in 1945.

1913 WINNIPEG RIVER POWER COMPANY was formed under the Companies Act of the Dominion of Canada as an associate company of WERCo. to develop the Great Falls power project (formerly known as Grand du Bonnet Falls). The company completed preliminary engineering research in 1914 and on September 1, 1915 was granted a charter to develop the site.

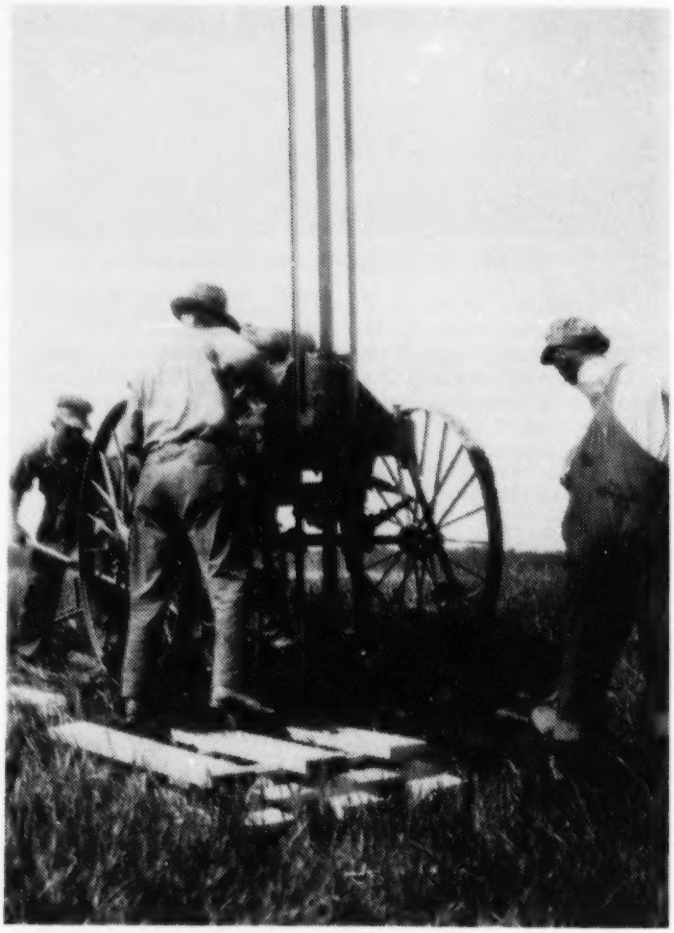
The affects of World War I brought the project to a halt in July 1916. Work resumed in May 1919, but ceased shortly afterwards owing to material shortages and uncertain financing. The project was ultimately taken over in 1920 by the Manitoba Power Company which completed the plant in 1923.



Pointe du Bois generating station (operated by Winnipeg Hydro) is the oldest plant still operating on the Winnipeg River today.

1913 DOMINION GOVERNMENT STUDIES OF THE NELSON & CHURCHILL RIVERS — The Canadian Department of Mines concluded a comprehensive geological survey of the Churchill and Nelson River basins to determine the power potential of Manitoba's northern river systems. The 1913 report formed the basis for further studies, undertaken half a century later, that ultimately led to the present development of Manitoba's northern water power resources.

1919 THE MANITOBA POWER COMMISSION came into existence with the Electric Power Transmission Act passed by the provincial government to "generate, purchase, transmit, and distribute electrical energy" throughout rural Manitoba. Under the Act, any municipality, many of which operated small and costly independent power systems, could apply for service through the Minister of Public Works. MPC initially contracted to purchase the power from the City of Winnipeg, and later from WECo. (see Seven Sisters Agreement 1931).



Drilling holes for hydro poles. (1928)

THE TWENTIES AND DEPRESSION YEARS

Substation shop employees. The station superintendent is the man front row at left. (1908)

1920 MANITOBA POWER COMPANY was formed as a subsidiary of Winnipeg Electric Railway Company to take over the rights and properties of the Winnipeg River Railway Company and Winnipeg River Power Company for the purpose of completing and operating the Great Falls hydro plant.

1920 PORTAGE LA PRAIRIE, first applicant for network service under the 1919 Electric Power Transmission Act, was connected to the Manitoba Power Commission system August 17 via a 60-mile steel tower transmission line from Fort Rouge substation on Scotland Avenue.

1921 RURAL ELECTRIFICATION began to materialize with Carman, Minnedosa, Morden, Roland and Virden receiving network power that year.

For a while the program looked hopeful. During the next seven years moderate progress was made to electrify rural areas with about 28 towns and villages receiving power. Then came the 1929 financial crash, the results of which adversely affected the program. Through the subsequent Depression, the Manitoba Power Commission managed to bring the count up to 145 communities before World War II broke out in late 1939. Now only airfields and military camps were given priority for new service; otherwise there was little chance of extending the benefits of electricity to rural Manitobans for the duration of the war. (See 1942 for details of the post-war rural electrification plan.)

1921 CANADA GAS & ELECTRIC CORP. OF BRANDON was formed with the consolidation of the Brandon Electric Light Company and the Brandon Gas & Power Company Limited (the latter established by Cyrus Eaton of the Abbott-Eaton Company, year unknown). Ten years later the company was taken over by Manitoba Power Commission.

1923 GREAT FALLS HYDRO-ELECTRIC GENERATING STATION (Winnipeg Electric Railway Co.) was officially opened January 4 by Sir James Aikins. Located on the Winnipeg River some 80 miles northeast of Winnipeg, the plant pioneered a number of new design features that have since become common practice in power plant development. The plant went into initial service with units 1 and 2 in operation. By 1928 all six units were installed for a total plant capacity of 132 000 kW. Today, Great Falls is Manitoba Hydro's headquarters for all the Winnipeg River plants.

1924 AMY STREET STEAM PLANT (City of Winnipeg Hydro) went into production with units 1 and 2 for a capacity of 10 000 kW. Units were added in 1954, 1955 and 1956 bringing the total plant capacity to its present 50 000 kW.

1924 The name of Winnipeg Electric Railway Company was changed April 5 to WINNIPEG ELECTRIC COMPANY by an amendment to the Act of the Corporation.

1931 SLAVE FALLS HYDRO-ELECTRIC GENERATING STATION (City of Winnipeg Hydro) went on line August 1 with units 1 and 2 in production for a total 17 000 kW capacity. Units were added in 1937, 1938, 1946 and in 1948 when the eighth and final unit was placed, bringing the total station capacity to 68 000 kW.

1931 SEVEN SISTERS HYDRO-ELECTRIC GENERATING STATION (Winnipeg Electric Co.) on the Winnipeg River about 63 miles northeast of Winnipeg went into service April 25. Largest plant on the Winnipeg River, it also operates at the highest head — 61 feet. In 1948 the capacity of the first three units was increased from 45 000 kW to 75 000 kW as the result of channel excavations that raised the forebay and lowered the tailrace by 8 feet and 5 feet respectively. Six more units were installed by 1952 for a total plant capacity of 150 000 kW.

1931 SEVEN SISTERS AGREEMENT — The provincial government entered into an agreement with Winnipeg Electric Company to supply power to the Manitoba Power Commission under the Seven Sisters Agreement. From 1919, MPC had been purchasing power from the City of Winnipeg Hydro.

1931 Manitoba Power Commission purchased the CANADA GAS & ELECTRIC CORPORATION of Brandon.

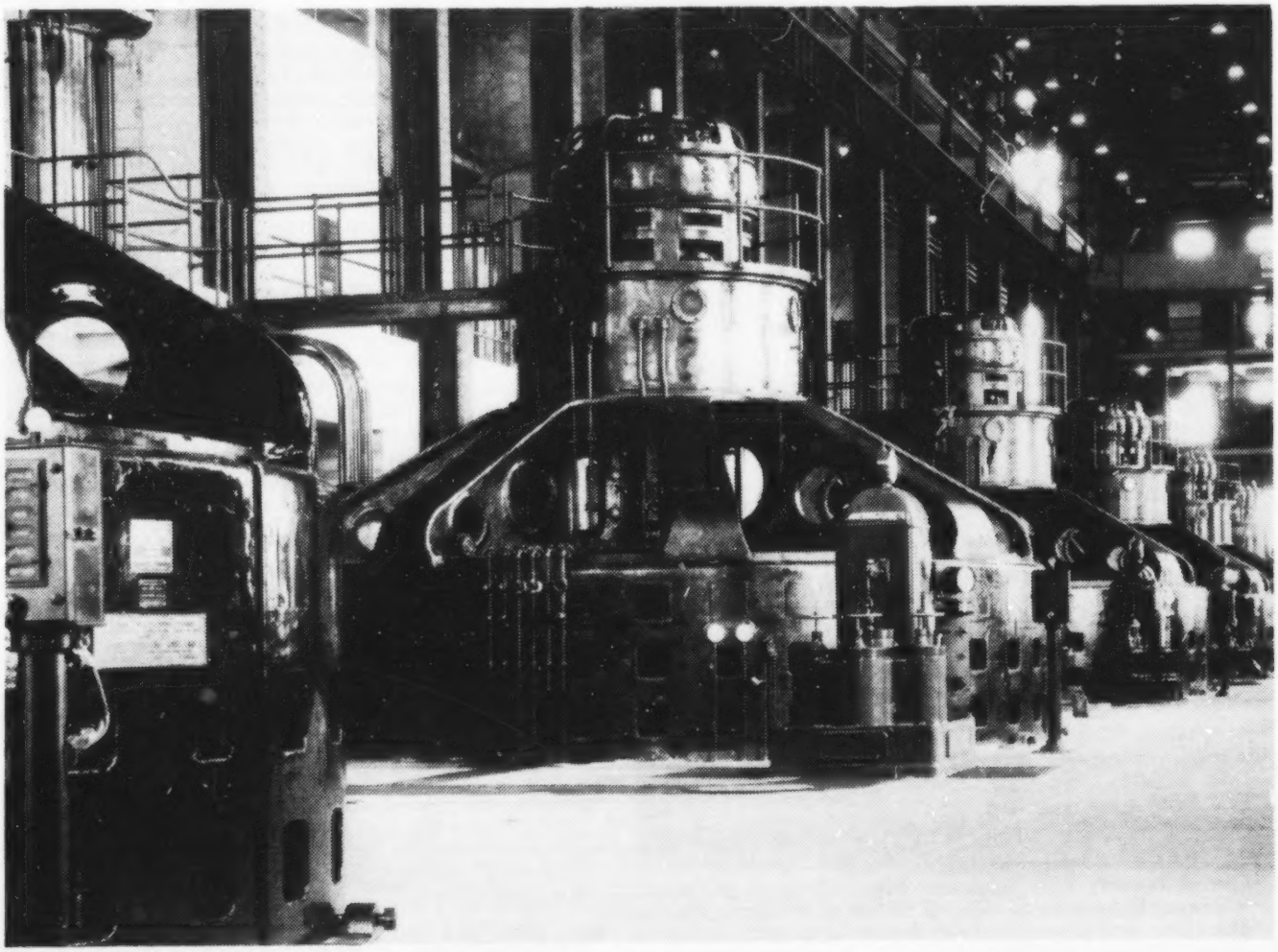
1931 MANITOBA POWER COMMISSION ACT — The policy of the Manitoba Power Commission since its formation in 1919 was to sell power to rural municipalities which in turn retailed the power to the individual customer. As a result there was no overall co-ordination of the system and considerable diversity of rates and policies existed. When the Depression came, local people began to feel its effects and municipalities in turn had trouble making their payments to MPC.

The situation called for a complete reassessment of the utility's policies. Subsequently the Manitoba Power Commission Act was passed by the provincial government to replace the Electrical Power Transmission Act of 1919. The new Act provided essentially for the reorganization of the Commission and the appointment of a Board consisting of three members.

1933 MUNICIPAL CONTRACTS CANCELLED — As a direct result of the Manitoba Power Commission Act of 1931, Manitoba Power Commission cancelled all municipal contracts under which the municipalities supplied power to the customer. Under the new policy, new contracts were drawn up providing municipalities with power for public service only, such as street lights, and MPC began dealing directly with the individual customer.

1936 WECo.'s PLAN OF CONSOLIDATION & RE-ADJUSTMENT APPROVED — in May 1935 a plan was proposed to reorganize the properties and operations of Winnipeg Electric Company and its associated companies including: Northwestern Power Company; Manitoba Power Company; Suburban Rapid Transit Lines; and Winnipeg Selkirk & Lake Winnipeg Railway Company. In general the plan provided for the consolidation of Winnipeg Electric, Manitoba Power Co., and Northwestern Power Co. into one company; and for Winnipeg Selkirk & Lake Winnipeg Railway and Suburban Rapid Transit Lines to operate as wholly owned subsidiaries. The plan was adopted in 1936.

1936 FIRST EXPORT OF POWER TO U.S.A. — The Dominion Government issued Manitoba Power Commission a licence to export a limited amount of power to Interstate Power Company serving North Dakota and Minnesota. MPC's interconnection line extended 1/2 mile from Gretna to the International Boundary.



Interior of the Great Falls powerhouse.

FARM ELECTRIFICATION EMERGES

1942 MANITOBA ELECTRIFICATION ENQUIRY COMMISSION — World War II brought about a shortage of hired farm help and the farmers, finding it increasingly difficult to handle their work single-handedly, finally presented a petition to Manitoba Power Commission demanding electricity. The Manitoba Electrification Enquiry Commission was subsequently formed in 1942 to investigate the feasibility of a postwar program of farm electrification. It recommended that a farm program designed to ultimately service 90% of all Manitoba farms (within a practical service area) be undertaken on a group or area basis. The plan was put into operation immediately after the war in 1945.

1944 NEEPAWA JOINS MPC — Manitoba Power Commission took over the distribution system of the town of Neepawa and network service began May 1.

1944 DAUPHIN JOINS MPC — Manitoba Power Commission took over the steam generating station and electrical distribution system of Dauphin. Network service began December 1 via the Minnedosa-Dauphin transmission line.

1945 FARM ELECTRIFICATION BEGAN — Following a Manitoba Power Commission trial survey to determine farmers' interest in an electrification program (based on the recommendations of the 1942 Enquiry Commission) a test project was made involving extension to nearly 1000 farms located in different areas. The success of the test project prompted a full-scale effort during the next decade to electrify southern rural Manitoba.

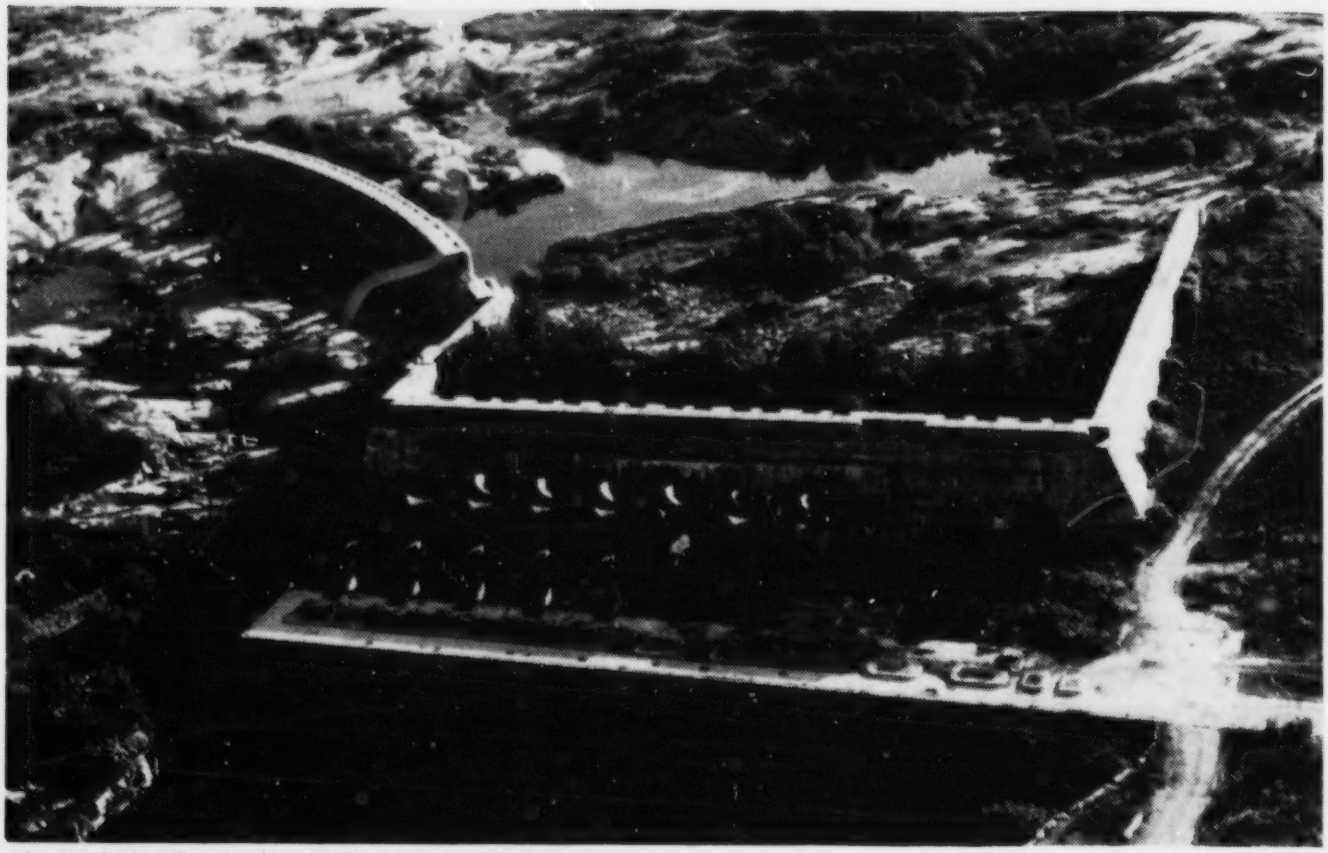
1948 MANITOBA WATER POWER COMMISSION (HOGG) REPORT — By the end of World War II both the Winnipeg Electric Company and the City of Winnipeg Hydro, after some 15 years of depression and war, were experiencing pressures of expanding economy. It was also becoming evident that, with an intensified program to bring electrical power to rural Manitoba, the generating capacity contracted to Manitoba Power Commission would soon become inadequate.

Street lighting comes to rural Manitoba.

Lineman on the Seven Sisters to Kenora transmission line. (1930)

In 1947 the provincial government appointed a royal commission headed by Dr. T.H. Hogg to study Manitoba's power industry and to submit a report on the best way to ensure adequate generating capacity. Dr. Hogg's report, presented in 1948, advocated that future capital costs of high-cost power development should be merged with existing low-cost power.

1949 FORMATION OF MANITOBA HYDRO-ELECTRIC BOARD — Following Dr. Hogg's report, the Winnipeg Electric Company, City of Winnipeg Hydro, Manitoba Power Commission and Manitoba Government finally agreed that the future power requirements of the province would be best served by a co-ordinated policy on developing and supplying electrical energy. In the absence of any immediate reorganization plan of the province's power industry, the end result of that decision was the formation of the Manitoba Hydro-Electric Board as an agency of the provincial government. First responsibility of the MHEB was to proceed immediately with the construction of a hydro-electric plant at Pine Falls on the Winnipeg River.



The first hydro-electric plant on the Winnipeg River, Pinawa.

A NEW DYNASTY FORMS

1951 MHEB MEMBERS APPOINTED — The first members of the Manitoba Hydro-Electric Board were appointed on May 18, 1951, the date that has gone on record as the beginning of the Manitoba Hydro-Electric Board as a separate entity. (From 1949 the provincial Department of Mines & Natural Resources had been conducting MHEB business until the Board members were named).

1951 PINE FALLS HYDRO-ELECTRIC GENERATING STATION (Manitoba Hydro-Electric Board) located on the Winnipeg River at Pine Falls went into service. The first power project to be developed under the Manitoba Hydro Electric Development Act of 1949, construction of Pine Falls was initiated by the Dept. of Mines & Natural Resources acting on behalf of MHEB. Six units were installed during 1951-52 for a total generating capacity of 82 000 kW.

1951 PINAWA POWER PLANT, the first hydro-electric plant on the Winnipeg River, was dismantled after 45 years of continuous service. The plant was retired to provide more efficient use of water flows at Seven Sisters generating station, the extension of which was completed in 1952.

1952 MANITOBA POWER COMMISSION TAKES OVER NATIONAL UTILITIES — Manitoba Power Commission purchased the transmission and distribution properties of the National Utilities Corporation Limited supplying six towns and villages in the Swan River Valley.

1952 MPC TAKES OVER BEAUSEJOUR — Manitoba Power Commission took over the supply of electrical power to the town of Beausejour from the City of Winnipeg Hydro. In 1957 MPC purchased the facilities outright.

1952-53 MHEB-WECo. AMALGAMATE — As an extension of recommendations made in Dr. Hogg's report of 1948, the provincial government had implemented a plan (known as Plan C) for the takeover of all generating facilities on the Winnipeg River. Plan C, however, was rejected by the citizens of Winnipeg on August 27, 1951.

As an alternative solution, the provincial government authorized the Manitoba Hydro-Electric Board to negotiate with the shareholders of Winnipeg Electric with a view to acquiring control and operation of WECo.'s generation and distribution assets. The negotiations culminated in a formal offer by MHEB on October 28, 1952. WECo. accepted.

The province did not wish to be in the gas or transit business. Conforming to the conditions made by the MHEB, on November 30, 1952 WECo. transferred its transit and gas assets to two newly incorporated companies known as GREATER WINNIPEG TRANSIT COMPANY and GREATER WINNIPEG GAS respectively.

By April 4, 1953 all issued and outstanding common shares of Winnipeg Electric came under the ownership of the MHEB. In other words, WECo. remained in business as a power generating and distribution utility only, with the MHEB in control.

1954 FARM ELECTRIFICATION MILESTONE was reached October 22 when the Manitoba Power Commission connected its 100 000th customer. By now, the farm electrification program was virtually completed with about 75% of all Manitoba farms having electricity.

1954 McARTHUR HYDRO-ELECTRIC GENERATING STATION went into service as the second power project undertaken by the Manitoba Hydro-Electric Board. Eight units were installed during 1954 and 1955 for a total generating capacity of 56 000 kW. The smallest plant on the Winnipeg River, McArthur marked the completion of the job of harnessing the river's potential.

McArthur has the distinction of being the largest hydro-electric plant in the world opertaing at such a low head (23 feet).

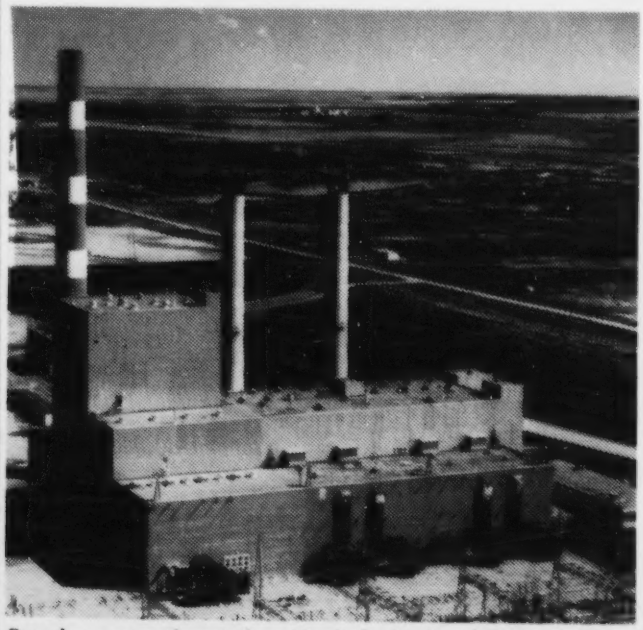
1955 THE TRANSFER OF WINNIPEG'S DISTRIBUTION PROPERTIES — An agreement was reached between the Manitoba Hydro-Electric Board, the Manitoba Power Commission and City of Winnipeg Hydro whereby:

1) all distribution properties in the suburbs owned by City Hydro were sold to Manitoba Power Commission which became the sole distributor of electrical energy in suburban Winnipeg and the rest of the province;

2) all distribution properties in the City of Winnipeg owned by the former Winnipeg Electric Company were sold to City Hydro which now became the sole distributor within the boundaries of the City of Winnipeg.

Under terms of the agreement, the Manitoba Hydro-Electric Board agreed to supply the additional power requirements of City Hydro. The two systems were interconnected at the Mill Street terminal in Winnipeg.

1956 FIRST INTERPROVINCIAL TIE-LINE went into service October 25 between Manitoba and Ontario for interchange of power. The Seven Sisters-Kenora transmission line connected the northwestern system of Ontario Hydro and the southern system of the Manitoba Hydro-Electric Board. Further power agreements have since been made with Ontario Hydro.



Brandon generating station, Manitoba Hydro-Electric Board's first coal-burning plant.

Servicing the farm customer.

1956 LAKES WINNIPEG & MANITOBA STUDIES — The governments of Manitoba and Canada entered into an agreement to carry out a flood control survey of Lake Winnipeg and Lake Manitoba and all waters flowing into these two lakes. The study was carried out by an appointed agency known as "Lakes Winnipeg & Manitoba Board". The Board's report in 1958 affirmed that regulation of the lakes would be advantageous to the development of potential generating sites on the Nelson River.

1957 BRANDON THERMAL-ELECTRIC GENERATING STATION, first coal-burning plant built by the Manitoba Hydro-Electric Board, went into initial service December 18 with one 33 000 kW unit. Three more units each rated at 33 000 kW were added in 1958. In November 1969 installation of a 105 000 kW generator was completed, bringing the total station capacity to 237 000 kW. The plant is located 1½ miles east of the City of Brandon.

1958 HYDRO'S FIRST MOVE NORTH — Manitoba Power Commission purchased the diesel generating facilities and distribution system of THE PAS ELECTRICAL UTILITY. Until then, Hydro activities were for all practical purposes confined to the more populated southern areas of the province. The takeover at The Pas was the first step north of the 53rd parallel and the start of a new chapter in the electrical power history of Manitoba.

1959 MPC APPLIANCE SALES DISCONTINUE — Manitoba Power Commission discontinued selling electrical appliances after being in the retail business for almost 40 years. Appliance sales had been an integral part of the Commission's load building program ever since the early 20's when all-out efforts were made to promote the use of electricity. By the 1950's, however, with many retailers now carrying electrical appliances, it was no longer practical for MPC to continue in the business.

1959 MPC PURCHASES CRANBERRY PORTAGE DISTRIBUTION SYSTEM — The privately-owned distribution system serving the northern community of Cranberry Portage was purchased by MPC. Diesel power was supplied under special arrangements with the Dept. of National Defence. Then, in 1964 Hydro installed its own diesel plant and in September 1976 Cranberry Portage was connected to the network system.

1959 SELKIRK JOINS MPC — Manitoba Power Commission purchased the electrical distribution system of the town of Selkirk.

Kelsey, first generating station on the Nelson River.

THE BIRTH OF MANITOBA HYDRO AND NORTHERN EXPANSION

1960 KELSEY HYDRO-ELECTRIC GENERATING STATION, first plant to be developed on the Nelson River in northern Manitoba, went into service June 23. The plant was built by the Manitoba Hydro-Electric Board to supply the power requirements of the International Nickel Company's townsite and mining, smelting and refining operations at Thompson. The original installation of five 32 000 kW generators was completed in 1961. Between 1969 and 1972 two more units were added, bringing the station's total capacity to 224 000 kW. Operating head at Kelsey is 53 feet.

1960 MANITOBA POWER COMMISSION assumed the responsibility for the distribution of electrical energy in the town of CHURCHILL previously supplied by the National Harbour Board from its elevator operations. Power supplies were secured from the federal government's military diesel electric generating plant at Fort Churchill until responsibility for generation was taken over by Manitoba Hydro in 1968.

1960 FIRST MANITOBA-SASKATCHEWAN INTER-CONNECTION went into service November 29 by means of a 138 000-volt tie-line between Brandon Generating Station and Saskatchewan Power Corporation's Boundary Dam thermal plant near Estevan. The line was raised to 230 000 volts in 1968. Subsequent agreements have since been made between the two provinces.

1960 SELKIRK THERMAL-ELECTRIC GENERATING STATION (Manitoba Hydro-Electric Board) located in East Selkirk delivered first power October 1 with two 66 000 kW steam turbo generators in service. In 1967 two gas turbines each capable of 12 500 kW were added to provide additional capacity for emergencies and peak load periods.

1961 FORMATION OF MANITOBA HYDRO — The Manitoba Government decided to unite the two provincial utilities, the MANITOBA POWER COMMISSION and the MANITOBA HYDRO-ELECTRIC BOARD. The Manitoba Hydro Act was subsequently passed by legislature providing for the amalgamation on April 1. This brought the organization of electrical utilities in the province to its present state: Manitoba Hydro responsible for the servicing of all Manitoba except for the inner area of Winnipeg, which is served by Winnipeg Hydro.

1963 NELSON RIVER FEASIBILITY STUDIES — On February 18 the Province of Manitoba entered into an approximate $1.3 million cost-sharing agreement with the Government of Canada to investigate the feasibility of developing the hydro-electric potential of the Nelson River. A Nelson River Programming Board was set up to carry out the investigations. Its report, tabled in the Parliament of Canada and in the Manitoba Legislature in 1964, led to a second agreement for a further $3 million study that was to be completed by 1966.

Also in 1963, Manitoba Hydro in agreement with both levels of government commissioned G.E. Crippen & Associates to investigate the economic feasibility of developing the lower Nelson River.

1963 DIESEL POWER GOES TO NORTHERN INDIAN COMMUNITIES — Norway House in northern Manitoba received power for the first time by means of an independent diesel generator plant. (The community was connected to the network system 10 years later.)

NORWAY HOUSE was the first native community to get service under a northern electification program that is still going on in cooperation with the Federal Department of Indian Affairs and Northern Development. During the last number of years an average 25 communities at a time have been served by diesel plants while other communities, like Norway House, have been transferred from diesel to network power as a result of expanding transmission facilities in the north.

1964 MAPP AGREEMENT — Manitoba Hydro signed a memo of understanding with the Mid-Continent Area Power Planners for possible interconnection lines with American utilities to carry large-scale exchanges of power. MAPP consisted at the time of 22 public and investor-owned electric utilities operating in the central and north-central states.

1964 CITY HYDRO, the name commonly used over the years to identify the City of Winnipeg Hydro Electric System, was changed to WINNIPEG HYDRO.

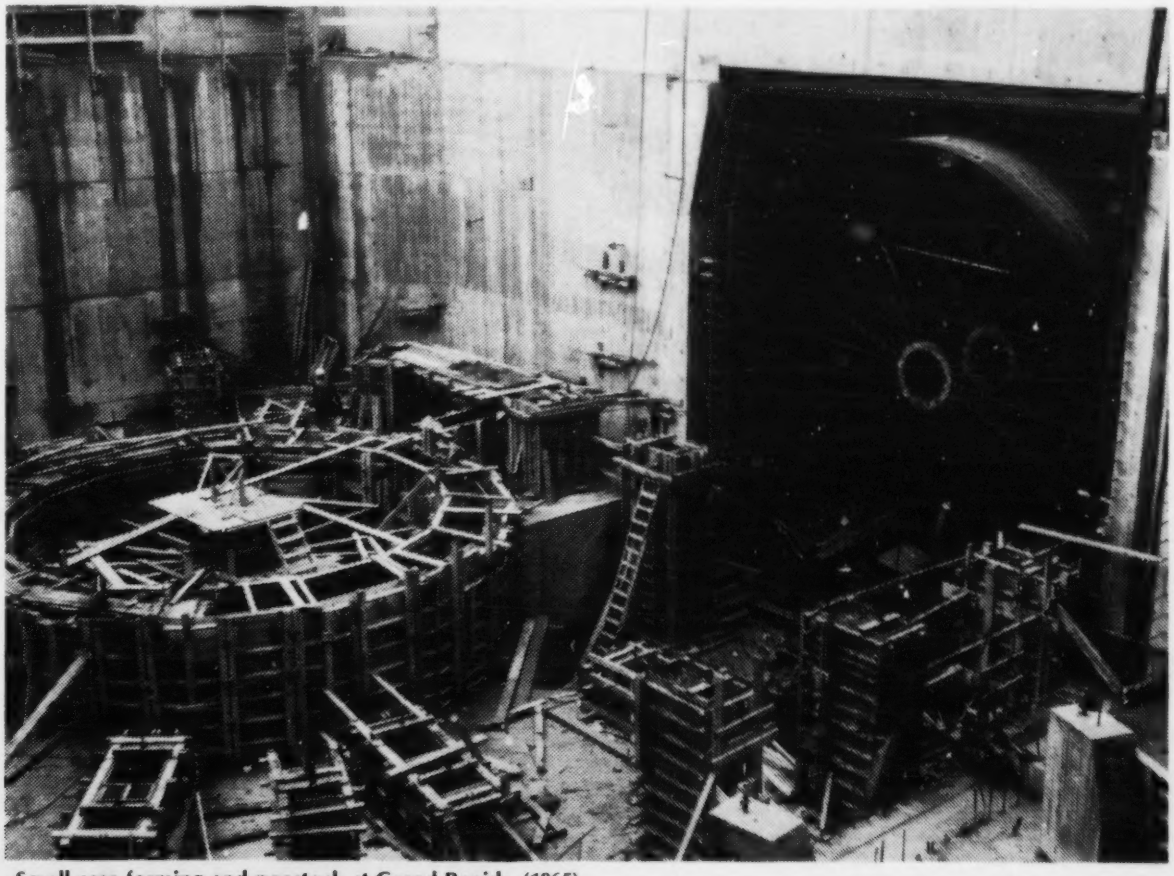
1965 GRAND RAPIDS HYDRO-ELECTRIC GENERATING STATION located on the Saskatchewan River (about 2½ miles from Lake Winnipeg) was officially opened November 13 with three units installed for a station capacity of 330 000 kW. The station was rerated in 1966 (339 000 kW) and again in 1967 (354 000 kW). In 1968 the final unit was placed in service bringing the total capacity to 472 000 kW with a 120-foot head, the largest operating head in Manitoba. The giant Kaplan turbines and generators at Grand Rapids are the largest installed in North America for this head.

One of the most challenging problems in developing the Grand Rapids forebay was the prevalence of limestone and dolomite in the region. To prevent water from seeping out of the storage area through the numerous crevices and separations found in limestone, it was necessary to form an underground seal beneath the dykes. Over 100 000 tons of cement were used in the sealing or "grouting" program, one of the largest of its kind ever attempted in the world.

1966 DEVELOPMENT OF NELSON RIVER BEGINS — As a result of the Nelson River Programming Board's investigations that began in 1963, the federal and provincial governments entered into an agreement February 15, 1966 to jointly undertake the development of the hydro-electric potential of the Nelson River.

The federal government's participation in the program was to finance (subject to a 50-year repayment by Manitoba Hydro) the direct current transmission facilities. Atomic Energy of Canada Limited was assigned to act as the federal government's agency in the construction of the line.

In accordance with the agreement, Manitoba Hydro began to develop the Kettle Generating Station on the lower Nelson River. The station was scheduled for service by 1971 (see 1971).



Scroll case forming and penstock at Grand Rapids. (1965)

1967 NELSON POWER CONNECTED TO SOUTHERN SYSTEM — A 230 000-volt line completed between Kelsey Generating Station (Nelson River) and the Grand Rapids Generating Station (Saskatchewan River) connected the southern integrated system with the northern system. The line established the first link between the Nelson River and the provincial southern grid. The 205-mile line was built primarily to supply International Nickel's new Soab Lake mine 47 miles southwest of Thompson.

1968 FIRST GENERAL RATE INCREASE in 57 years went into effect with all meter readings taken after July 15. The increase was required to raise $3.3 million in additional annual revenue needed to maintain a proper proportion of reserves. In addition to increasing Hydro total revenue by 6%, the new rate schedule reduced variations in rates and standardized minimum bills. Subsequent rate increases went into effect from 1974.

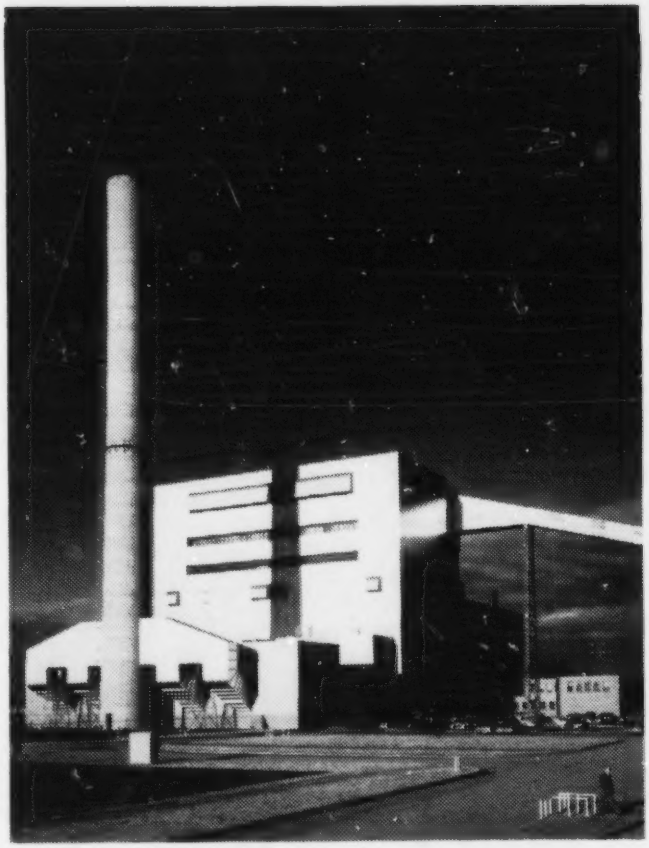
1968 THE PAS DIESEL PLANT RETIRES — The Pas was connected to the Integrated System by means of new 230 000-volt and 115 000-volt lines from Grand Rapids. The diesel plant that had served the community since 1914 and taken over by Manitoba Power Commission in 1958, was subsequently retired.

1968 HYDRO TAKES OVER CHURCHILL — The Churchill diesel plant was taken over by Manitoba Hydro from the Federal Dept. of Public Works. Since 1960 Hydro had been responsible only for the distribution of power in the town.

1969 NORTHERN MICROWAVE COMPLETED — The final link in a 632-mile microwave system from Winnipeg to Gillam was completed. A joint venture of Manitoba Telephone System and Manitoba Hydro, the system was designed primarily for controlling the direct current transmission of Nelson River power to the south. In addition, the microwave system improved north-south telecommunications and brought live television to northern residents.

The system follows a route through the Interlake area to Grand Rapids, thence northeast via Thompson to Gillam, where it terminates at Hydro's Radisson Converter Station.

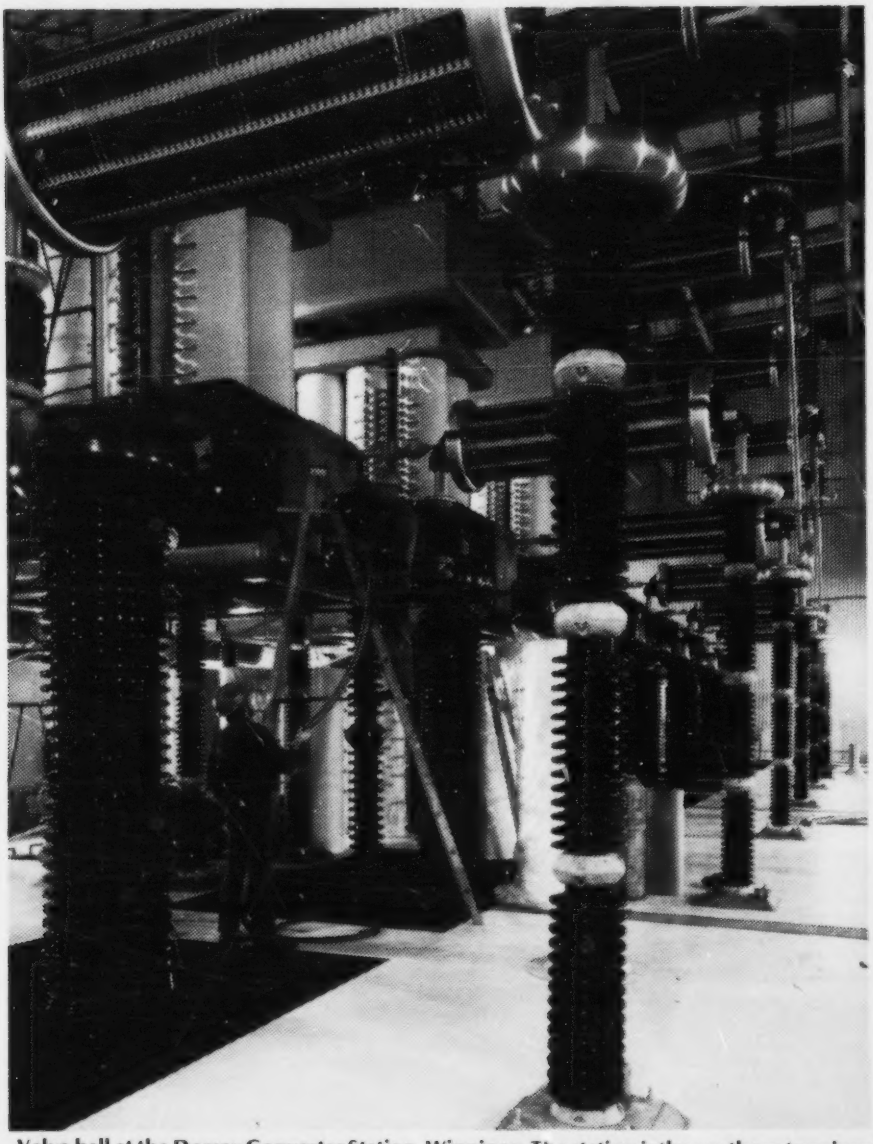
A second microwave system following a route east of Lake Winnipeg was completed in 1977.



Selkirk generating station.

Manitoba Hydro acquires a new head office at 820 Taylor. (1963)

A PERIOD OF GROWTH AND CHANGE



Valve hall at the Dorsey Converter Station, Winnipeg. The station is the southern terminus of the 560-mile Nelson River transmission system.

1970 KETTLE HYDRO-ELECTRIC GENERATING STATION was the first generating station to be developed on the lower Nelson River and the largest plant to be developed in Manitoba. Located about four miles downstream from the community of Gillam and 445 air miles from Winnipeg, the plant went into service with unit 1 on line four months ahead of schedule. Harnessing a 98.5 foot head of water, the plant is designed for 12 turbo generators each with a capacity of 106 000 kW. The station was completed in November 1974 with a total plant capacity of 1 272 000 kW.

1970 U.S. MANITOBA INTERCHANGE — The National Energy Board granted Manitoba Hydro a permit to establish an interconnection with three large midwestern utilities in the U.S.A. The 230 000-volt transmission line from Winnipeg to Grand Forks, N.D. was completed and placed in service in July for an interchange of power with the Northern States Power Company of Minneapolis, Otter Tail Power Company of Fergus Falls and Minnkota Co-op of Grand Forks. The 145-mile line cost a total $7.7 million with Manitoba Hydro's share being about $2 million.

1970 LAURIE RIVER HYDRO PLANTS JOIN SYSTEM — The plants were officially taken over June 1 by Manitoba Hydro from Sherritt Gordon Mines Limited. Located about 40 mile south of Lynn Lake in northwestern Manitoba, the two plants originally went into operation in 1952 and 1958 respectively to supply Sherritt Gordon's mining operations in the area. The plants consist of a total three units for a combined capacity of 10 000 kW. Number 2 plant is operated by remote control from Number 1 plant. Operating head is 55 feet.

In conjunction with the Laurie River takeover, a 133-mile long 138 000-volt transmission line was constructed from Thompson to connect the Laurie River plants and the community of Lynn Lake to the provincial network system.

1970 DEVELOPMENT OF LAKE WINNIPEG REGULATION BEGINS — Under terms of an agreement between the Province of Manitoba and the Government of Canada in February 1966, Manitoba Hydro was authorized to proceed with a plan of Nelson River development which included using Lake Winnipeg as a

reservoir. By excavating channels to increase the natural outflow capacity of the lake, and by building a control structure at Jenpeg to regulate the outflow, adequate minimum flows, according to the plan, could be guaranteed for hydro sites along the lower Nelson River.

1971 NELSON RIVER EHV DIRECT CURRENT LINE ENERGIZED — Constructed by Atomic Energy of Canada Ltd. under the provincial-federal agreement of 1966, the extra-high-voltage direct current twin steel transmission tower lines carrying power from Nelson River were energized: the Gillam-Grand Rapids section on May 31 and the Grand Rapids-Gillam section in late October.

Referred to as Bipole 1, the lines began transmitting power in June 1972. Bipole 1 now operates at 900 000 volts (+/- 450 000 volts nominal). When completed it was the highest voltage ever used anywhere in the world. The lines, at 556 miles, are also among the world's longest.

1971 DORSEY AND RADISSON STATIONS OPERATIONAL — The construction of the Dorsey Converter Station actually started in 1968, but didn't become operational until 1971 with the completion of Bipole 1. Located near the town of Rosser, Dorsey acts as the southern terminus of the HVDC line. The Radisson Converter Station, located near Gillam, also became operational in 1971. Radisson serves as the northern terminus of the HVDC line. The power generated from the Nelson River stations as alternating current (AC) is converted to direct current (DC) at Radisson for transmission to Dorsey. When the DC reaches Dorsey it is converted once again to AC for distribution to southern Manitoba.

1972 SECOND MANITOBA-ONTARIO TIE-LINE IN SERVICE — A 230 000-volt line connecting Manitoba Hydro's Whiteshell Station near Seven Sisters with Ontario Hydro's terminal station near Kenora began transmitting power in October. The line was constructed in accordance with a 1971 agreement replacing the original agreement of 1956. Under the new agreement, Manitoba Hydro would sell Ontario Hydro over $26 million worth of power by April 1978. Both the new and the original power lines are used to transmit the power.

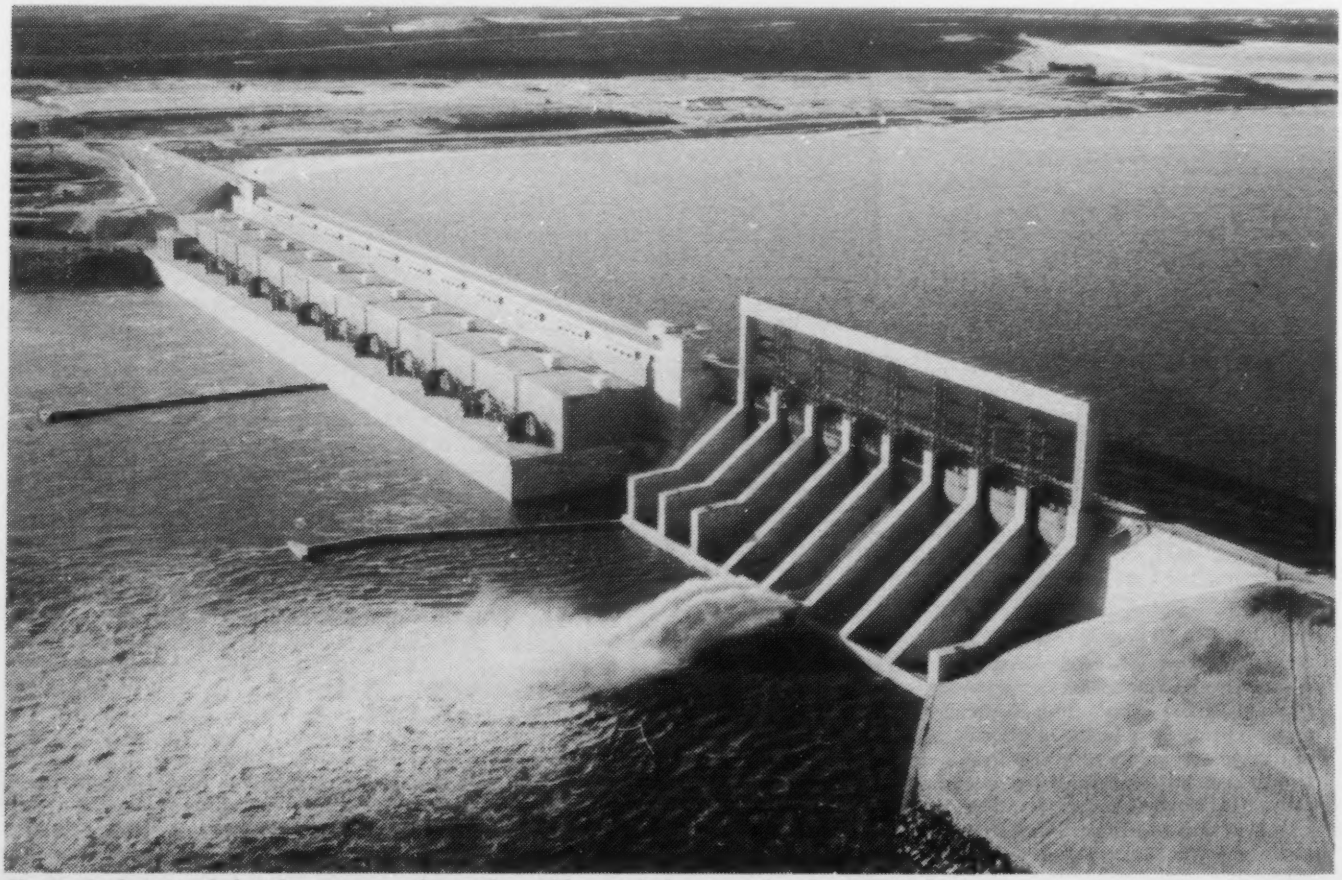
A subsequent power exchange agreement was made in 1974 for the sale of $47 million worth of surplus power.

1972 SECOND MANITOBA-SASKATCHEWAN POWER INTERCONNECTION was completed via a 110-mile, 230 kV high voltage line between Dauphin, Manitoba and Yorkton, Saskatchewan with an intermediate station at Roblin. The interconnection, permitting an interchange of up to 150 000 kW, was built in accordance with an agreement made between the two utilities in 1970.

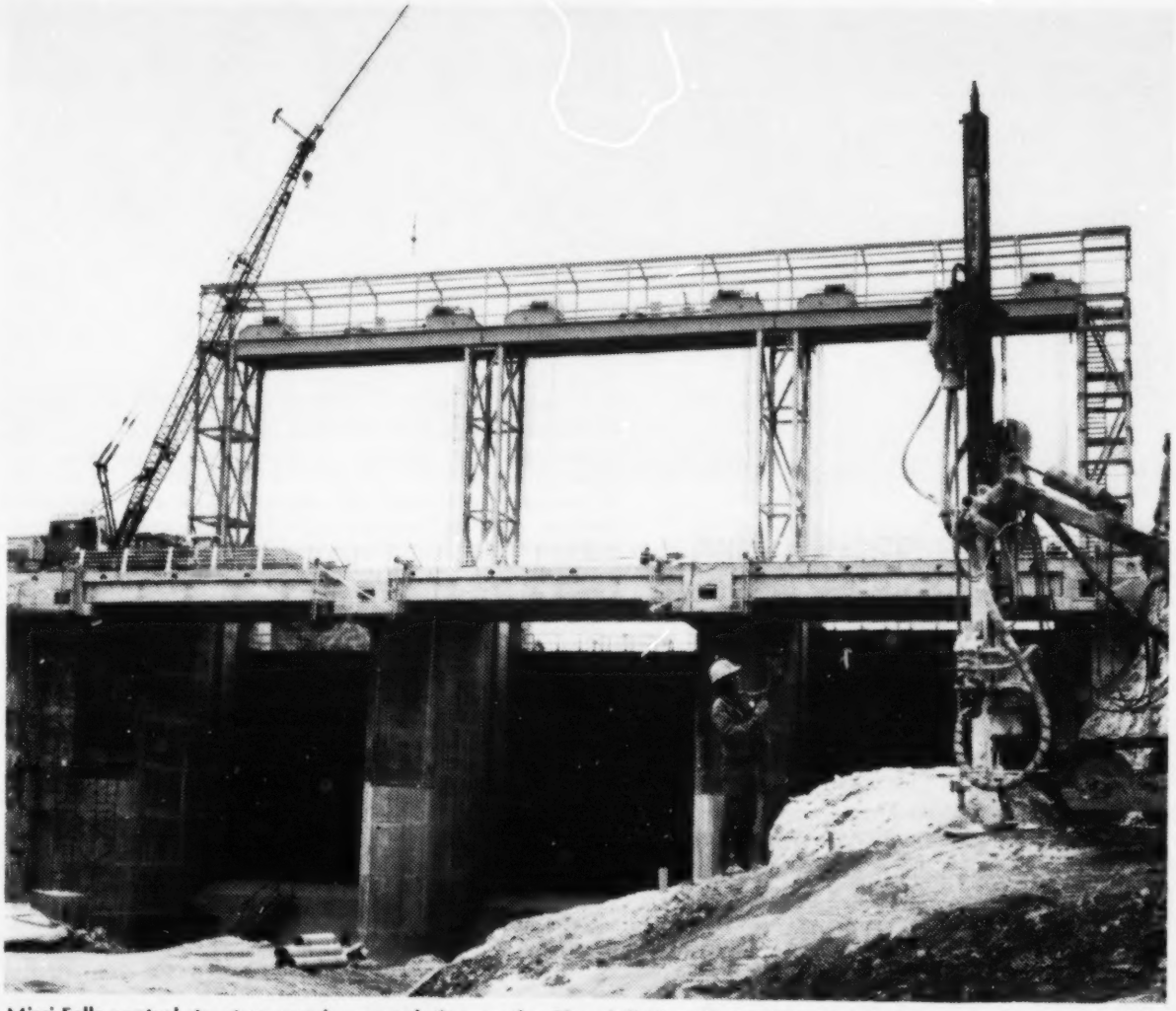
1972 REGIONALIZATION — IN 1972 Manitoba Hydro had adopted a new organization plan designed essentially to decentralize certain head office functions to bring about more effective customer service. The plan went into full operation by April 1, 1973.

Previously, the province was divided into 12 service Areas (now only 11) that provided administration for the local District operations. The Area Managers reported directly to Field Operations Division at Winnipeg head office.

Under the new plan, the province is now also divided into three geographic Regions (Eastern, Western and Central) with the Areas within each Region reporting directly to the respective Regional Director. Each Region is responsible



The Kettle dam, Manitoba's largest generating station, with a total plant capacity of 1 272 000 kW.



Missi Falls control structure nearing completion on the Churchill River in Northern Manitoba.

for planning, designing, constructing, operating and maintaining the electrical distribution system within its respective area, and for ensuring reliable and efficient customer service.

Overall system planning and design, power generation and major construction works continue to be the responsibilities of Winnipeg head office.

1973 RATE EQUALIZATION PLAN — A plan developed by Manitoba Hydro and Winnipeg Hydro to equalize rates for consumers residing in Unicity Winnipeg was approved by Winnipeg City Council June 21 and became effective August 1. The equalization of rates was required by an Act of Legislature (City of Winnipeg Act) of July 30, 1971 which among other things required that the rates for electricity be the same for both Manitoba Hydro and Winnipeg Hydro consumers living within the boundaries of the area known as Unicity.

1973 LAST INDEPENDENT ELECTRICAL SYSTEMS IN THE PROVINCE JOIN HYDRO — Manitoba Hydro assumed responsibility for the northern communities of FLIN FLON and SNOW LAKE by agreement with Hudson Bay Mining & Smelting Company Limited. Hydro acquired the distribution facilities of the Northern Manitoba Power Company Limited, a subsidiary of HBM & S. The Churchill River Power Company Limited, another subsidiary of HBM & S, continue to supply the company's mines, mill and smelter from its Island Falls generating station in Saskatchewan.

With the takeover of Flin Flon and Snow Lake, Manitoba Hydro now has full responsibility for the transmission and distribution of power for all of the province with the exception of the City of Winnipeg which is served by Winnipeg Hydro.

1973 LONG SPRUCE PLANNING STUDIES COMPLETED — The Long Spruce Generating Station, 14 road miles downstream from the Kettle Generating Station also became accessible by an all-weather road connected to Gillam.

1973 A new CORPORATE LOGO was designed and adopted.

1973 MORE NORTHERN COMMUNITIES JOIN CENTRAL STATION POWER — The communities of South Indian Lake, Norway House and Cross Lake served initially by diesel generation were transferred to central station power. The communities of Gods River and Shamattawa were added to the 23 isolated communities that are serviced from local diesel electric generating stations.

1974 HYDRO BEGINS NUCLEAR STUDIES — A small nuclear development department was established to begin the task of potential site identification.

1975 GRANVILLE LAKE AND PAUINGASSI GO DIESEL — Northern communities received electric service from diesel powered generation in 1975 while Pine Dock and Matheson Island formerly served by diesel were connected to the system. Diesel generating capacity was increased at the communities of Little Grand Rapids, Red Sucker Lake, St. Theresa and Waasagomach.

1975 TWO OUT OF THREE LAKE WINNIPEG DIVERSION CHANNELS IN USE — The control structure in Jenpeg was completed later in 1975 and completion of the remaining 2-mile channel between Lake Winnipeg and Playgreen Lake was scheduled for the fall of 1976. Installations of the first bulb-type turbines to be used in North America was underway at Jenpeg with the first scheduled to go into service in 1976.

1975 TRANSMISSION LINE FROM FLIN FLON TO CRANBERRY PORTAGE — Comstock International Ltd. was awarded a contract to construct this line. The 30-mile wood pole transmission line, designed for a 230000-volt operation, will operate initially at 115000 volts.

It will form the first leg of a transmission tie-line that will ultimately provide a second supply line to Flin Flon. Value of the line construction is about $1 million. Related substation work will add about another $500000 to the total cost. Service date is expected September 1976.

1975 GRAND RAPIDS TO VERMILION 230 kV LINE COMPLETED — An existing 115 kV line between Brandon and Glenboro was converted to 230 kV operation while an 11-mile 230 kV circuit was completed on the east side of Winnipeg between the Ridgeway and St. Vital transformer stations.

1976 LONG SPRUCE ON ITS WAY — All major concrete work was completed and construction of the powerhouse well advanced. The second stage diversion was accomplished and the earth fill section of the main dam was under construction. The project was on schedule and the first of ten 98-megawatt units will go into service July 1977.

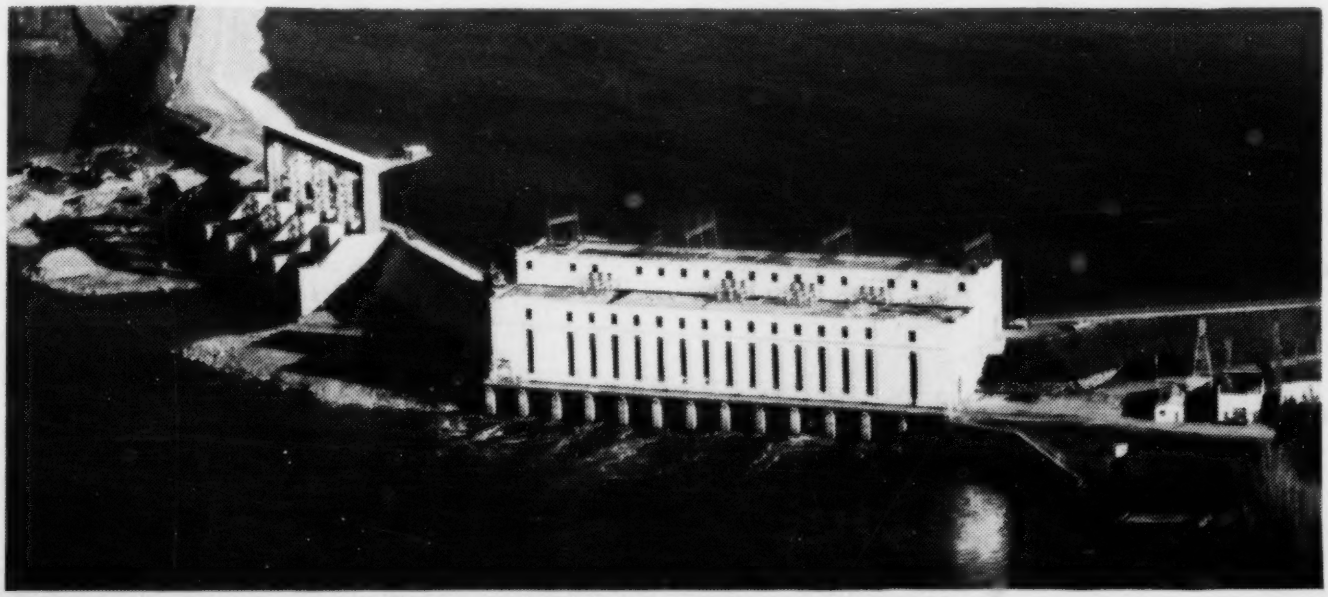
1976 CHURCHILL RIVER DIVERSION PROJECT COMMENCED OPERATION — In September the project released an initial flow of approximately 10000 cfs through the Notigi Control Structure. Much of the project was completed in the spring. The main control structure at Missi Falls on the Churchill River channel from Southern Indian Lake was also completed.

Mitigation work related to Churchill River Diversion was advanced with the negotiation of a 1650-acre land clearing contract. Former Hydro Chairman Len Bateman and Chief Nelson Linklater of the Nelson House Indian Band signed the contract February 2, 1977.

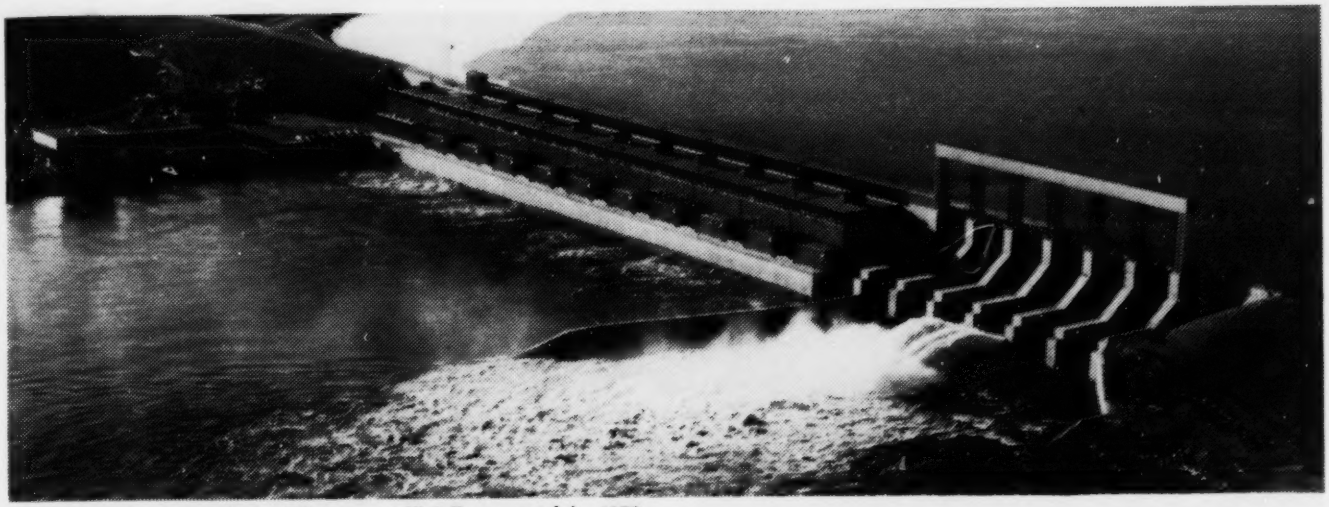
During the year, work was also completed at Nelson House and Thompson. It is expected that full diversion of 30000 cfs will be achieved by the fall of 1977.

1976 AGREEMENT REACHED ON 230 kV CONNECTION with Minnesota Power and Light Company of Duluth to establish the interconnection at the international border in southeastern Manitoba. Manitoba Hydro received a Certificate of Convenience and Necessity to build a line from Ridgeway Station to the U.S. border south of Sprague. Licenses were also granted for the export of interruptible energy firm power and firm energy during the period November 1976 and October 1982.

The cost of the Manitoba segment of the line from Ridgeway Station near Birds Hill to a border point south of Sprague, has been estimated at $6.7 million. South of the border 200 miles of line from Hibbing to Duluth would be built by the American utilities Minnesota Power and Light.



The Great Falls generating station's spillway was replaced during restoration work begun in 1979.



Long Spruce generating station was officially opened in 1979.

Co. of Duluth and the Minnkota Power Cooperative Inc., Grand Forks.

1976 SECOND NORTHERN MICROWAVE SYSTEM BEGINS — In conjunction with the Manitoba Telephone System, work has begun on a second microwave system into northern Manitoba. This system will ensure a high degree of reliability for the expanded DC transmission system and will also provide improved telephone service and live television to a number of northern communities. The new system will be completed in late 1977.

This link is being constructed on the east side of Lake Winnipeg. It will provide an alternate route for HVDC control and communications, and to ensure a high degree of reliability for the first and second bi-poles.

The first buildings and towers were shipped to remote sites during February 1976 and the system is scheduled to be in service October 1977.

1976 CRANBERRY PORTAGE EXTENSION ENERGIZED — A 230 kV extension to Cranberry Portage from Flin Flon was energized September bringing central station power to the community of 924 residents. The community of Baker's Narrows, midway along the 30-mile extension from Flin Flon to Cranberry Portage also obtained service. The retirement of the 2500 kVA diesel generating station meant an estimated annual saving of 440000 gallons of diesel fuel.

1977 ICE STORM — South-central Manitoba experienced the most severe icing conditions in the history of the corporation. Most sub-transmission lines in the area were out of service at various times and all required some form of ice removal. A total of 7400 kilometres of conductor was rolled to remove ice during and following the storm, and 1600 km of conductor was de-iced using ice-melting techniques. About 1500 poles and 600 crossarms were broken and the associated hardware damaged.

The most severely affected small towns and villages were without power for periods of up to 49 hours. Hundreds of farm customers were out, some for as long as six days. The cost was $1.4 million.

1977 LONG SPRUCE — The first 98000 kW turbine generator went into service October 1977. All ten units were on line in August 1979. The station was officially opened by the Premier of Manitoba on June 16, 1979.

1978 LETELLIER TERMINAL INSTALLED — To accommodate load growth in southern Manitoba a major 230-66 kV terminal was established at Letellier, tapping the 230 kV international power line which connects La Verendrye Station with Prairie Station in North Dakota. At the same time, communications facilities using a microwave radio link were provided to accommodate protection, voice, supervisory control and telemetering for the protection and control of the La Verendrye-Letellier U.S. transmission line.

1978 HPS LIGHTING — The first installation by Manitoba Hydro of High Pressure Sodium (HPS) lighting was completed at the Perimeter Highway and Roblin Blvd. interchanges on the west side of Winnipeg. The HPS lighting is more efficient than mercury vapor (MV) which has been used in Manitoba for street lighting almost exclusively for many years.

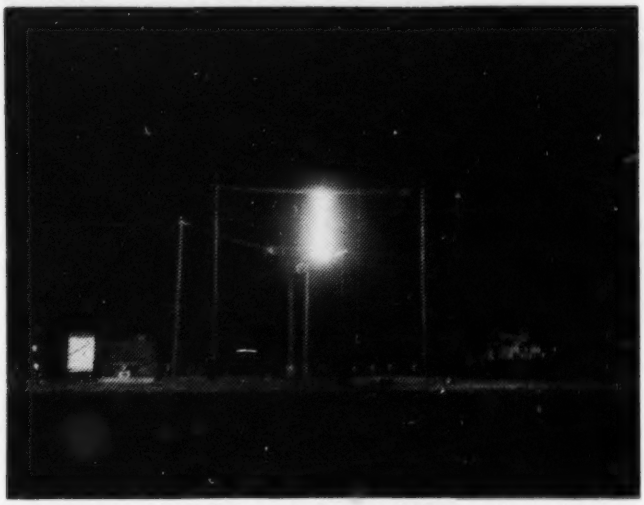
1978 LIMESTONE DEFERRED — Due to lower than expected provincial load growth, the scheduled in service date of the Limestone G.S. was deferred from 1984 to 1987. This resulted in suspension of further work on the Lower Nelson project following completion in October 1978 of the Stage 1 cofferdam. The Limestone camp, town and associated works were shut down for an indefinite period.

1978 HENDAY CONVERTER STATION — With the construction of the new Henday Converter Station near Limestone, the second HVDC bipolar transmission line went into service. Henday performs the same function as the Radisson station, namely converting AC to DC for transmission south to Dorsey. Bipole 2 transmitted power from Henday to Dorsey for the first time on October 1, 1978. With the addition of Henday, additional conversion equipment was also added at Dorsey.

1979 GREAT FALLS REVITALIZED — A major rehabilitation project began at the 56-year-old Great Falls Generating Station on the Winnipeg River. The work included replacement of the spillway and west non-overflow dam. Cracks in the water passages underneath the powerhouse were sealed and the head gates reinforced. Repairs to the station's electrical and mechanical equipment are now in progress.

1979 SEVEN SISTERS DAM RECONSTRUCTION — A contract was awarded for the reconstruction of the north dam at Seven Sisters G.S. Throughout the year, work included construction of an access road to the work site, foundation preparation, installation of anchors and the placing of approximately 60% of the concrete for the new north dam.

1979 JENPEG ON LINE — The last of the six turbine generators at the Jenpeg Generating Station on the Upper



By bringing a grounded conductor to within one foot of the high voltage conductor, a fault was staged on the new 500 kV line. This was to determine if relaying and protective systems were functioning properly. Results were favourable with the fault barely causing a flutter on the system.

Nelson River was placed in service on November 4, 1979. The station's total nameplate rating is 168 000 kilowatts, with a winter capability of 126 000 kilowatts.

1979 THIRD INTERCONNECTION WITH SPC — The Pas-Squaw Rapids Line, Manitoba Hydro's third interconnection with the Saskatchewan Power Corporation's system, went into service in November 1979. The 230 000 volt wood pole line, extending from The Pas to SPC's Squaw Rapids hydro station improves system stability and increases interchange capabilities for both provinces.

1979 ENERGY RATE STABILIZATION ACT came into force April 1 which enabled the government of Manitoba to implement a five-year fixed power rate for all Manitoba consumers other than bulk purchasers and those on separate contracts. The Act provides for the Province of Manitoba to relieve the corporation of the costs associated with the foreign debt of Manitoba Hydro by replacing them with Canadian equivalent costs based on Canadian rates for similar terms at the date the debt was incurred.

1980 MOOSE LAKE JOINS SYSTEM — The community southeast of The Pas joined the provincial network system. The diesel plant which served the northern community for the past 15 years has been retired. A 66 kV line brought residents unrestricted use of electricity for the first time. The changeover from diesel to network power is estimated to save about 450 000 litres of fuel annually.

1980 500 kV COMPLETED — Construction of the 500 000 volt Winnipeg-Minneapolis transmission line was completed. The new line is the third U.S. interconnection.

Seven Sisters rehabilitation work. (1982)

Jenpeg generating station and control dam on the Upper Nelson River.

Operating at 500000 volts it is the highest alternating current voltage ever used in Manitoba. The new line more than doubles Manitoba's interchange capability with the U.S. The northern terminus of the 500000 volt line is at Manitoba Hydro's Dorsey Station.

1980 MANDAN LETTER OF INTENT SIGNED — A letter of intent was signed by Manitoba Hydro and the Nebraska Public Power District for the proposed 500000 volt MANDAN transmission link between Manitoba and Nebraska. Later in the fall a set of alternative transmission line corridors was defined and meetings were held with interested parties to discuss corridor preference.

1981 LAC BROCHET COMMISSIONED — A 525 kilowatt diesel generating installation was commissioned in November at Lac Brochet, a remote site 40 km south of the 59th parallel near the Saskatchewan border. A 350 kilowatt diesel station was designed for Tadoule Lake, about the same latitude as Lac Brochet, with an in-service date of midsummer 1982.

1981 COMPUTER TRANSLATES PULSE METERING DATA — Manitoba Hydro acquired a specially designed computer, the first in Western Canada, to translate pulse metering data for customer billing. With pulse metering, total consumption and times of consumption are recorded by electrical impulses on magnetic tape. The information on the tape is then translated by computer to give more accurate information than previously possible about the customer's consumption and load pattern. Pulse metering is being used for all new customers whose demand exceeds 1000 kVA and existing customers with a demand exceeding 2000 kVA are converted to the system.

In addition to providing information for billing purposes, pulse metering aids research of customer load patterns. Accurate information is obtained on the cost of service for rate studies and it will assist customers to control their costs through practising energy management.

1981 WIND TURBINE EXPERIMENTED — A vertical axis wind turbine was installed near Churchill, Manitoba on the shores of Hudson Bay. Manitoba Hydro entered into a parallel generation agreement with the Churchill Research Centre whereby the Corporation pays for power and energy received from the customer. The experimental installation was rated at 75 kilowatts.

1981 OXFORD HOUSE WASTE HEAT CHANNELLED — An agreement between Manitoba Hydro and the Department of Indian Affairs and Northern Development arranged that waste heat from the diesel electric generator at Oxford House will be used for space and water heating in the adjacent school.

1981 SUPER EFFICIENT HOMES IN GILLAM — The six energy efficient houses were built by Manitoba Hydro to test a variety of energy efficient techniques in housing. The design heat loss of each house is only 4 kilowatts as opposed to 24 kilowatts in conventional houses of comparable size.

1982 HVDC RESEARCH CENTRE IS WORLD'S FIRST — A complete research centre for HVDC technology opened in Winnipeg on January 15. The research centre is a consortium of five sponsoring organizations: Manitoba Hydro, the University of Manitoba, Teshmont Consultants, Federal Pioneer Electric Ltd. and the Province of Manitoba.

1983 HUDSON'S BAY MINING LOAD TRANSFER — The Hudson Bay Mining and Smelting Co. Ltd. load in Flin Flon, presently supplied from Saskatchewan Power Corporation's Island Falls G.S. was transferred to the Manitoba Hydro operation. Additional 230 kV transmission facilities in Flin Flon were built to handle the extra load. Because Island Falls is not connected with the Saskatchewan Power Corporation electrical grid, negotiations were underway with SPC for the use of Manitoba Hydro facilities to transmit power from Island Falls to SPC.

1983 THE PAS-FLIN FLON 230 kV LINE IN SERVICE — A 230 000 volt transmission line between The Pas and Flin Flon was placed in service. The line and new terminal station at Flin Flon will provide a firm supply to the Flin Flon area and also result in a fourth interconnection with SPC, in this instance, with their Island Falls Generating Station on the Churchill River. SPC will be contributing two-thirds of the annual costs of these facilities. The sharing of costs was based on the relative benefits to each of the two utilities.

1983 ICE STORM — Severe icing conditions in the southwestern and central parts of the province between February 27 and March 10 caused widespread service interruptions lasting up to five days for some farm customers. A work force numbering up to 944 employees and volunteers worked throughout the storm on ice removal and service restoration. The storm covered a significant area of the province; from the Saskatchewan boundary to just east of Winnipeg and from the U.S. border to a line running from Riding Mountain National Park to Gimli.

1983 BLOODVEIN CONNECTED TO GRID — The Bloodvein Indian Reserve on the east side of Lake Winnipeg was connected to the provincial grid in March. It was the first of five native communities switching from diesel generation to central supply as part of Manitoba Hydro's east of Lake Winnipeg project.

1983 SEVEN SISTERS REHAB COMPLETED — The rehabilitation program at the Seven Sisters Generating Station was completed below budget at a total cost of $22 million. The restoration program, spanning five consecutive years, extended the life of the plant by another 50 years.

1983 RUD INSTALLED BETWEEN MANITOU AND DARLINGFORD — A 13 km stretch of overhead powerline between Manitou and Darlingford was replaced with rural underground distribution cable. The RUD program is an attempt to minimize power outages caused by ice storms affecting vulnerable overhead lines.

1983 GILLAM TO CHURCHILL TRANSMISSION LINE — In late 1983, the federal and provincial governments announced plans for a cost-sharing agreement which included the construction of a transmission line from Gillam to Churchill.

1984 HVDC ACHIEVES MILESTONE — The HVDC system achieved the first successful operation of valve group 42 at Henday and Dorsey stations. It enabled the HVDC system to bring an additional 450 megawatts of power from the Nelson River to southern Manitoba.

1984 AGC/SCADA INSTALLED AT LDO — The AGC/SCADA computer-based control system was installed at the Load Dispatch Office to provide automatic generation control (AGC) and supervisory control and data acquisition (SCADA) functions. The system monitors Manitoba Hydro's network of generating stations, transmission lines and exports to neighboring utilities, automatically adjusting generation and load to meet Manitoba's requirements.

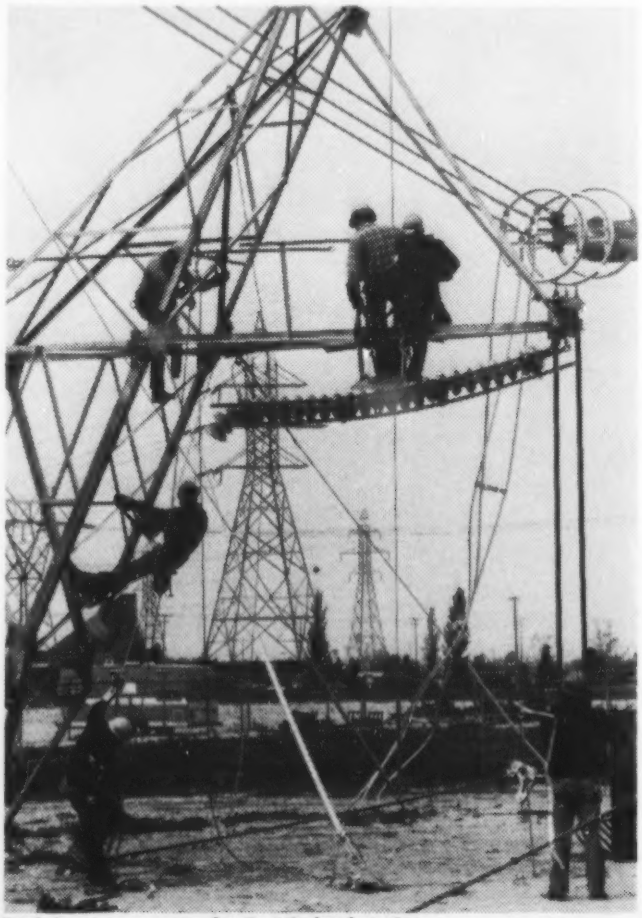
1984 BERENS RIVER, PRINCESS HARBOUR AND LOON STRAITS CONNECTED — Three other Indian communities in Manitoba Hydro's east of Lake Winnipeg project were connected to the provincial grid in March. They were Berens River, Princess Harbour and Loon Straits.

1984 EMERGENCY LDO — In March, a trial run of a new emergency Load Dispatch Office (LDO) proved successful. The emergency LDO will be used for operational training, equipment testing and in the event of a Winnipeg LDO emergency requiring evacuation.

1984 ICE STORM — In April, Manitoba received another serious ice storm with damages to the utility amounting to $4.1 million so far. Heavy rains and freezing north winds struck Manitoba customers in the southwestern and interlake portions of the province. The storm destroyed approximately 3 500 wood poles and 12 steel towers on the 230 kV line between Brandon and Winnipeg.

As a direct result of two of the worst ice storms in the province's history occurring in consecutive years and the resulting damage to Manitoba Hydro, the utility established a special ice storm task force to deal with the problem. The five-year $25 million plan was implemented on February 15, 1985.

1984 POWER SALE TO U.S. — In June the provincial government signed a letter of intent with the Western Area Power Administration of Golden, Colorado. The letter indicated a proposed power sale would commence in 1993 for a term of 35 years.



Training tower near the St. Vital substation.

1984 TORNADOES STRIKE SOUTHERN MANITOBA — Tornadoes ripped through southern Manitoba in July causing an estimated $250 000 damage to distribution and transmission lines.

1984 HYDRO SIGNS CONTRACT WITH SOUTHERN INDIAN LAKE FISHERMEN — Manitoba Hydro and the Southern Indian Lake Commercial Fisherman's Association signed a $2.5 million compensation agreement for damage caused by the raising of Southern Indian Lake and the Churchill River Diversion.

1984 ELIE-CABOT RUD — In November, Central Region installed another stretch of rural underground cable (RUD) in an area prone to damages and power outages resulting from ice storms. The line connects the Elie and Cabot substations.

1985 CORPORATE AFFAIRS AND EXPORT SERVICES CREATED — Two new departments at Manitoba Hydro were created early in the year: Corporate Affairs and Export Services. Corporate Affairs was established in recognition of Manitoba Hydro's serious commitment to northern interests and to a program of affirmative action which will allow northerners - especially those of native ancestry to participate more extensively in and benefit more fully from northern development.

Export Services was established with the intentions of exporting Manitoba Hydro's expertise to other utilities and organizations, specifically in developing countries. Through the skills of its own employees, Manitoba Hydro now offers knowledge at every level of power system development. Export Services represents an entirely new avenue of business for the utility.

1985 LIMESTONE GETS GO-AHEAD — In January, the Premier of Manitoba announced that Manitoba Hydro would call for tenders on the general civil contract for the Limestone Generating Station. The contract was contingent upon Manitoba Hydro obtaining approval from the National Energy Board to export power to Northern States Power of Minneapolis.

In March, the National Energy Board issued a 12-year license to the Manitoba Hydro-Electric Board for the export of firm power and energy to Northern States Power of Minneapolis. The license allows Manitoba Hydro to export a maximum of 500 megawatts of firm power in each 12-month period from May 1, 1993 to April 30, 2005.

Later that same month, Canadian General Electric was awarded the contract to supply the 10 turbines and generators required for the Limestone Generating Station.

In June, the general civil contract for Limestone was awarded to a consortium involving Bechtel Canada Ltd. and Kumagai-Gumi Co. Ltd. The general civil contract is the largest single contract associated with the construction of Limestone.

1985 PUKATAWAGAN AND GRANVILLE LAKE CONNECTED TO GRID — In March, the Pukatawagan Indian Reserve and community of Granville Lake in northwestern Manitoba were connected to central supply. The 69 kV line was constructed in accordance with the terms of a cost-sharing agreement between Manitoba Hydro and the Department of Indian and Northern Affairs.

1985 MANDAN TERMINATED — Manitoba Hydro was informed on March 29 that the Board of the Nebraska Power District of Columbus, Nebraska had passed a resolution calling for the termination of the proposed MANDAN transmission line. The main reason cited for the termination was the failure to secure a commitment from the other participating U.S. utilities for cost-sharing arrangements.

The MANDAN route and right-of-way studies that were completed up to this date will be used in studies presently underway with the Western Area Power Administration, with whom Manitoba Hydro presently has an agreement for the export of power.

1985 BIPOLE 2 REACHES FULL POWER — On June 17, the third stage of Bipole 2 was completed, enabling the HVDC transmission line to operate at 1 000 000 volts (+/- 500 000 volts nominal). Bipole 2 adds an extra 2 000 megawatts of capacity to the system.

1985 CSS INTRODUCED — Manitoba Hydro customers serviced by the Transcona District Office were the first to benefit from the new computerized Customer Service System. CSS was established to streamline Manitoba Hydro's customer services by providing localized access to accounts.

The first stages of construction at the Limestone Generating Station.

Workers fabricate a draft tube form for the Limestone powerhouse.

Past Commissioners, Chairmen and General Managers of the Manitoba Power Commission:

—Terms refer to annual reports, year-ending November 30:

J.M. Leamy, Commissioner — 1920
J. Rocchetti, Acting Commissioner — 1921-1923
C.A. Clendening, Commissioner — 1924-1926
D.L. McLean, Commissioner — 1928-1930
D.L. McLean, Commissioner and Chairman — 1931-1932
H. Cottingham, Chairman — 1933-1945
W.D. Fallis, General Manager — 1946

—Terms refer to annual reports, year ending March 31:

W.D. Fallis, General Manager — 1947-1961
R.C. Smellie, Chairman — 1948-1961

Chairmen, Vice-Chairmen, General Managers and Presidents of the Manitoba Hydro-Electric Board:

—Terms refer to annual reports, year-ending March 31:

D.M. Stephens, Chairman and General Manager — 1952-1956
D.M. Stephens, Chairman, President and General Manager — 1957-1961
D.M. Stephens, Chairman — 1962-1967
W.D. Fallis, General Manager — 1962-1967
W.D. Fallis, Chairman and General Manager — 1968-1969
W.D Fallis, General Manager — 1970-1971
D. Cass-Beggs, Chairman — 1970-1972
L. Bateman, Chairman — 1973
L. Bateman, Chairman and Chief Executive Officer — 1974-1978
G. Reid, General Manager — 1973
L.M. Wedepohl, Vice-Chairman — 1979
C.E. Curtis, Vice-Chairman — 1980
L. Blachford - President and Chief Executive Officer — 1980-1982
K. Kristjanson, Chairman — 1981
S. Cherniack, Chairman — 1982-1984
J. Arnason, President and Chief Executive Officer — 1984-1986
M. Eliesen, Chairperson 1985-

General Managers of Winnipeg Hydro:

J.G. Rossman, City Power Manager — 1911-1912
J.G. Glassco, General Manager — 1912-1944
J.W. Sanger, General Manager — 1944-1951
H.L. Briggs, General Manager — 1952-1955
T.E. Storey, General Manager — 1955-1960
D.C. Bryden, General Manager — 1960-1969
R.T. Harland, General Manager — 1969-1978
K.H. Hallson, General Manager — 1978-